EXTERMINATORS LOG

JANUARY 1935 "Don't Tolerate—Exterminate" VOL. 3, NO. 1

A MESSAGE TO EXTERMINATORS

Our company has served the Exterminating Industry for many years.

We believe in the Exterminating business.

We believe that a true spirit of cooperation among its members can accomplish enormous good in the interests of the individual firm, the public, and the cause of sanitation in general.

Exterminators should always remember that their industry is an important one. The service they render is of the utmost importance to the health and mental comfort of the entire public.

As an individual Exterminator, do your part towards placing the Exterminating business on a high plane of integrity.

Think well of your profession and before long the public will agree with you.

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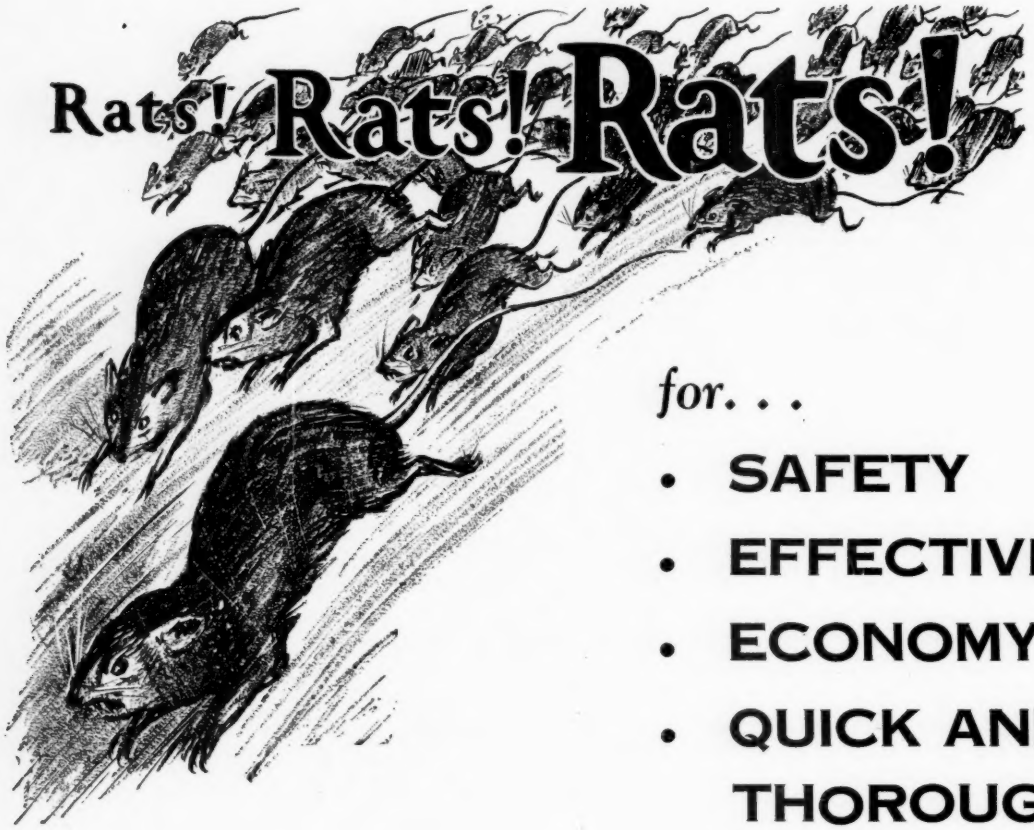

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512 East 14th Street, Kansas City, Missouri

(Subscription Price, $3.00 per Year)

The National Pest Control Association was sufficiently impressed with "The Index," that was published in the January and February issues of The Log, that request was made for copies which might be inserted with one of the regular membership service letters and thus become a part of the regular material that might be filed for future reference as there would be occasion to read different articles on various subjects. "The Index" includes all the leading articles and editorials that have been published in The Exterminators Log from 1933 through December, 1937, issues. The Log is pleased to furnish this information with its compliments in its endeavor to be of service to the pest control industry.

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EXTERMINATORS LOG

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Al Cossetta, Manager and Editor
J. W. Smith, Associate Editor

B. M. Allegro, Business Editor

Official Organ of the National Association of Exterminators and Fumigators, Inc.

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Associate: Open to subsidiary firms of an active member firm engaged in the service work as above described. Dues $7.50 yearly.

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For further details, communicate with

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EDITORIAL

With this issue, the LOG enters its third year since its inception. From the beginning, there was a question as to how long it would require the LOG to play an important part in promoting unity of thought and action—service and a medium to assist the individual exterminator and the entire industry.

Realizing the responsibility entailed in such an undertaking, and with the thought in mind that our industry needed a wholesome, constructive and cementing force, the LOG set out to accomplish this purpose in playing that important part, which later exceeded our expectation.

The LOG from time to time has endeavored to stress the important aspect of the industry and to render nothing but the best to its members.

A year ago in the January issue of the LOG, there appeared in the Editorial column the following paragraph: "Little was realized by the industry as to what value the LOG would be, little was realized that the exterminating industry was receiving a journal that was to inform the industry of valuable information." True to its statement, the primary object and dominating motive of the LOG, was to become a powerful medium in disseminating valuable and useful information to the industry.

While the LOG to a great extent has succeeded in accomplishing its ideals, we are not forgetful to extend our profound appreciation to the subscribers and advertisers as well as to the members for their loyal support and keen interest for the success of the LOG. We certainly appreciated the splendid whole-hearted cooperation that the members have rendered in aiding us to be able to contribute valuable articles and information to the industry.

We trust that our advertisers, subscribers and members continue to support the LOG as in the past. By doing so, we will assure you that the LOG will become bigger and better in every way.

The LOG has enjoyed a very rapid growth, and as the organization grows, its usefulness increases. We are looking forward to even bigger and better things for 1935.

We extend the season's greetings and wish our readers a HAPPY NEW YEAR. MAY 1935 BRING PROSPERITY TO ALL.

Soiled, threadbare, torn in pieces, and badly frayed around the edges, 1934 was literally worn out.

The past year with its economical and financial conditions, has been no respector of individuals. Societies have curtailed activities, governments have functioned with caution and fear, and business has felt the lack of stimulating influences. All have, more or less, suffered alike. Ambition, cupidity and greed have, to a great extent, brought trouble.

Under the past trying conditions, our organization points with pride to the record it has made, and the progress it has accomplished. The indefatigable courage, and unflagging spirit of our leaders in these times of world unrest, stand well nigh unmatched in moral courage and professional acuteness.

More than ever do we need to possess such characteristics that are so tremendously vital to the progress and success of our industry. Patience, honor, tact, diplomacy, culture, and astuteness are the outstanding qualities that will not only characterize the modern progressive exterminator, but the industry as a whole.

The past years of experience, largely through trials and errors, have built for us a storehouse of knowledge worthy to become the foundation of our industry. The hope of ideals, coupled with the moral courage and professional cooperation that now seems possible of reality, is certain to lay out a program of growth and development for us that the industry as yet has never experienced.

Let us look for 1935 to hold something better for us, and the mysterious quality of that something that we are looking forward, should make it all the more desirable. And in the search for what 1935 has for us, we can work cooperatively in such harmony that will in itself make for improvements and progress in our industry.

The expression of that famous historian "United We Stand, Divided We Fall" is not all poetry. It pronounces a sound principle of cooperation. It should serve as a challenger to our faith in our own business as well as to our own industry.

Realizing the importance of much needed advances in our industry to strengthen the upward trend of business, we must put in as much as we expect to take out. We must recognize that everything worthwhile costs. The greater its value, the greater the price we must and should gladly pay.

May 1935 inspire us all to be lifters and not leaners. Yet willing to share the benefits of our enterprise to which we belong and unwilling to bear the heavy burden. Not to stand by and look on, while others toil and sacrifice.

ETHICS

Writes one firm: "I have never been in such a state where competition was so keen and cut throat methods were so open and unscrupulous. All one has to do is to suggest something new and a new racket is developed by daybreak. After two years of study and collection of the (the name will be omitted so that the firm cannot be singled out), we placed an educational display in a prominent bank window and two days later we found companies canvassing from house to house soliciting business, using the information obtained from our window and even going so far as to state that they were with our company, taking jobs for treatment at any price."

Possibly this is one of the reasons that it should become necessary to emphasize more and more that only firms that display the National seal and National slogan will serve as a protection? Possibly it is also the reason why it is felt that certain legislation is necessary? Possibly this is also the reason why there is some dissatisfaction. No matter how we ascribe reasons, it is obvious that better firms throughout the country should exchange views on these unethical practices and come to a decision as to how they can best be met.

INSURANCE

It is almost unnecessary to go into detail as to the time and study that has been given by the National Association of Exterminators and Fumigators to this problem. There are some in the industry who may not think this a problem but in those cities where legislation exists and calls for compulsory insurance or bond and the further possibilities of there being greater requirements in many other places, many firms will appreciate the advance steps being made.

The co-operation being received by the manufacturers is indeed commendable. The latest effort is worthy of comment. Recognizing some of the problems involved and desiring to be of real service to our industry, the R & H Chemicals Division of E. I. Du Pont de Nemours & Co. has furthered the cause of making it possible for firms to secure public liability insurance that will specifically cover the work being done by the exterminators and fumigators.

TERMITES

Several have remarked, "Are you not giving too much space to the subject of Termites in The Log?" The answer is "NO." The general endeavors of the exterminators and fumigators may be confined largely to the commonly known vermin and insects; such as roaches, rats, mice, bedbugs, fleas, ants, silver fish, etc. And even in that field we find individuals who think that all that is necessary is to "buy a bag, put a few insecticides in it, and canvass for work." The unfortunate thing is that it only takes a few of these last described individuals to make the public become mistrustful when calling upon exterminators and fumigators to eradicate existent conditions. Honest to goodness knowledge of the vermin and insects being exterminated should be the immediate prerequisite of the exterminator and fumigator who in turn should follow-through with an even greater knowledge of the successful treatment for the given cases involved. To put ourselves on a professional basis of becoming recognized as a second line of defense in public health because of genuine knowledge of our field will bring a confidence on the part of the public and the clients who order work to be done.

The emphasis on termites is largely made because of the frequency with which exterminators take these jobs and render unsatisfactory services. It is felt that real money can be made in this field of termite control and eradication if exterminators will study very carefully all that is involved when undertaking termite jobs. There is no reason why professional exterminators should not expect to receive fees commensurate with the proper knowledge and work done on the basis of proper knowledge that will compare with what more competent physicians and surgeons receive as they are called to the sick room to give their expert advice and treatment.

Look forward to the February issue of The Log which will contain another valuable article by Mr. F. W. Harper.

We desire to compliment Norman C. Dold of the Rose Exterminator Co., of Chicago, on the thoughts that he has expressed in the address delivered at the annual convention of the National Association that was held in St. Louis last October. There is no object in writing a different editorial when thoughts are so well expressed by Mr. Dold. We print verbatim:

When I was asked to talk on the subject of "Organization and Cooperation," I naturally wondered what the Committee had in mind for me to cover in the space of fifteen minutes, which was allotted me. I accepted the assignment and immediately wrote to several of our officers and asked them if they would like, through me, to express any of their own ideas. Some of the men were kind enough to write and make suggestions which could be classified under either heading.

It is somewhat paradoxical that one from Chicago should be asked to talk on the subject of "Organization and Cooperation," for if there is any metropolitan center in America where there is any greater lack of cooperation than is evidenced in Chicago, I have not seen it. This in spite of several attempts on the part of the owners of Chicago firms to form a local association.

As I study both words—"Cooperation" and "Organization"—they strike me as being somewhat nebulous. One could talk at great length and in vague generalities, but I refuse to do that, realizing that my time is short and the time of everyone here, today, is valuable.

If I had an assignment such as "English methods contrasted with ours," or, "What Recent Research in Rodent Control Has Taught Us," or some specific subject such as that, I could readily confine myself to the point at issue and tell you something which I believe would be decidedly constructive, as others have done and will do in the course of this convention.

Cooperation, as such, needs no sponsorship from me, for we all agree it is advantageous. That fact is axiomatic and has been demonstrated times without number. Cooperation is shown quite vividly and conclusively by a picture which Mr. Raley sent me, and which I take pleasure in showing at this time. It is a rather homely illustration, but it tells more in one glance than I could say in a great many words. You will see an apple tree, a goat and a mule; neither could get at the apples by themselves, but they got the apples just the same for the mule stood still and the goat got on top of him, and together they got the apples. I think that demonstrates what cooperation will do.

I might preface my remarks by saying that without cooperation, organization is futile and useless. I find that most employers are sold on the idea of an association for our industry, especially if someone else will do the work which is required and, in some instances, if someone else pays the bills. Under such circumstances, an association is ideal. It fights one's battles and helps solve problems. But what about this thing—"cooperation," when one finds it right on his own doorstep? In the abstract it is fine, but what about it in the concrete?

Are you willing to pass on to others some of your discoveries? I never expect to see the extermination business reach the point in ethics where the physicians are. You know, if a physician discovers a new cure for cancer today, he will tell others about it at once. I hardly expect exterminators or fumigators to do that. However, there is much that we can do in this regard. Are you willing to give a lift to a competitor? If his plant should be destroyed, tomorrow, by fire or by an act of God, would you offer more than sympathy? Would you strike him when he is down flat on the mat or would you cooperate? By concentration, I do not mean losing one's identity or his supreme anxiety to cooperate, but it does mean being ethical in our dealings with our fellowmen.

We hear a great deal these days about "rugged individualism." I believe in that and I think much of the greatness of our splendid nation can be attributed to industrial leaders who are individualistic. One can be a rugged individualist and all that that term implies and still cooperate with others in his industry. We can engage in unlimited private research and still work with others for the general welfare of our industry. If we cease our research, we will become stagnant; if we do not cooperate, we will become provincial.

In my company—and you will pardon this personal reference—we have found that cooperation between the fourteen district offices has greatly aided us. The exchange of ideas at a company convention, the publishing our own house organ, known as "Rat Tales," has helped everyone in our organization, from the top to the bottom. Without cooperation, we would disintegrate; with cooperation, nothing within reason is impossible.

Already our National Organization has accomplished a great deal through cooperation among its members and by fighting certain problems with a united front. I refer at this time to the code situation in Washington, the legislation and insurance problems, all of which will come up at the proper time.

I want to pay tribute, at this time and under the caption of "Organization and Cooperation," to our two magazines, "Scap" and particularly the "Exterminators' Log" for the splendid part they have played in helping to knit our Organization together.

I read in the "Monsanto Current Events" which crossed my desk, the other day, about a woman out riding in a car with her husband. The car broke down; they got somebody to tow them

in; along the way she said, "Isn't it an outrage that that fellow would charge us $10.00 for towing us three miles?" The husband said, "That's all right, he's earning it, I have my brakes on." Too many of us have reluctantly paid our $10.00 dues, but we have had our brakes on too long. I think many of us, if we want to cooperate, will "release the brakes" and determine to definitely aid our industry in whatever way we can.

I believe we are on the right track and our present organization will grow and prosper to the end that our industry will become increasingly more important, and we will profit in direct proportion to the way our industry prospers. There is no reason why our organization should not take its place along with the other trade associations representing various important industries.

Again I say, I want to be specific and not talk in terms of vague generalities. I have investigated several trade associations, among others the Bakers' Association. They were confronted with many of the same problems that our industry faces. They found good and bad bakers, large and small, ethical and unethical, educated and uneducated. They have been sold on the idea that better methods could be had, if they sent their employees to certain baking schools to learn more about their business, and to subscribe to their magazine, "The Baker's Helper"; read it carefully; and, after that, cooperate with the others in the business.

A better case is that of the florists and their so-called "exchange." They started a few years ago, with fifty-seven members; they now have six thousand members. If you wanted to send flowers from here to Oshkosh, all you would do is to see a man here and, in a few hours, the flowers would be delivered. Each member is under bond, and by binding themselves in this manner, the florists have greatly increased their usefulness to the public. Incidentally, this phase of their business netted them $4,000,000 last year, and last year was considered a dull year for the florists.

Speaking in terms of millions, I wonder how many of you know that the retail insecticide products sold in this country. in the year 1929, amounted to $18,000.000. I do not think the exterminators can do what the florists have done, but that is an example of what cooperation will do in an industry, and while talking about them, the florists have done something which we could very easily do, and which I will propose in a moment; and that is: concentrate on an appropriate slogan and have the entire industry use it on their stationery. billboards, and wherever we advertise. It happens the florists have concentrated on one slogan for a period of years. You have seen this slogan, "Say It With Flowers." It is a simple slogan but effective. I made it a point to interview several florists, and they said that the slogan meant money in their cash registers.

I have been giving a lot of thought to the matter of a simple slogan for our industry, and one that would apply across the length and breadth of our land. I do not know that I have struck upon it, but I submit one—if for no other reason than to suggest a hypothetical case. I suggest the slogan, "Don't Tolerate—Exterminate!" That is one that has not been extensively used, and would apply for those who retail and for those who do service work. If thousands and thousands of folks across this nation would be confronted with that slogan, periodically during the year, it would eventually take root and cause the people to act. And after all is said and done, action is what we want. (As published in the Log last month, Vogel-Ritt Exterminating Co. has given all members of the National Association of Exterminators & Fumigators the privilege of using this copyrighted slogan.)

When your company has a slogan and my company has one, we each have one. They are probably doing some good, but they cannot do the amount of good that concentrating on one slogan by the entire industry would naturally do. I think, in making this suggestion, it is in line with the subject of my talk, namely, "Organization and Cooperation." The more you think about this, the more sold you will become on the idea; of that fact I am certain.

I feel that this Convention represents the very cream of the exterminating and fumigating business. To make the effect of this talk tangible, I think we should each resolve here and now to cooperate one with the other. If we have failed in the past, let us from this moment help each other and the industry as a whole, whenever an opportunity presents itself. That may sound like a lot of "Polly Anna" talk, but it is not. It is good sound business and has been demonstrated by other associations. Cooperation means not only a lot of good intentions and resolutions while here at this convention, but it means putting them into practice back home in Chicago, San Francisco, New York, Dallas, Hoboken, and wherever you are operating.

"Which way? Uphill, of course. It will roll downhill of itself. It is easy to drift with the tide and to curl up on the cushion in the bottom of the boat and drift."

Doubtless the above picture is just about the situation of some of our local associations as far as sending reports is concerned.

Local association secretaries, roll up your sleeves and get to work. Send in your local reports and let us know what your good members are doing.

Don't curl up and drift — wake up and send in your reports.

OPPORTUNITY

No man ever had to wait for opportunity. Many men have been so blind to their possibilities that they have wasted much time in getting their eyes opened. Some have tried to deceive themselves by using their waiting as an excuse to cover their laziness.

Opportunity is not limited by locality, by time, or by conditions. Men are succeeding in every possible circumstance, in places and at periods where and when other men claim that no opportunity exists. The difference between the men who succeed and those who fail under similar conditions lies in the ability of the former to discern opportunities when they present themselves.

It is sometimes said that successful men make their own opportunities. This is not an exact statement, as all opportunity comes from a divine source. But successful men are those who have power to see the opportunity that to other eyes may be hidden by seemingly negative conditions.

The knowledge of the spiritual origin of opportunity should be an incentive for one to develop a power of spiritual discernment that will enable him to look beyond every deceptive appearance and see clearly the road to progress. Opportunity is omnipresent, as God is omnipresent; it is eternally new, it is constantly within the reach of him who has eyes to see.

The vital force in business life is the honest desire to serve. Business, someone has well said is the science of service. The real work of every man, woman and child employed in it is to render some kind or measure of service. The ones who will reach the top are not content with doing what is demanded of them. They do more. Modern business is not a system of bargaining, but an organized opportunity to be helpful to vast numbers of people. "He profits most who serves best."

There is a word in our language which everyone has to get acquainted with sooner or later, and that is "must." It is a word which ties us up and makes us do what we don't want to do, or prevents us from doing what we want to do. It is a hard and unbending word, but the world would be a pretty difficult place to live in if we didn't have it. "Must" is the backbone of all the discipline of life. We must eat. We must drink. We must sleep. We must respect the property of our neighbors.

Everybody struggles against "must," but it is natural for everybody to do what he wants to do, but nobody can beat it. That is the thing to realize. All your life you will be encountering this word, and the sooner we get it into our heads that the "musts" have got to be regarded, the happier we're going to be.

Industrial Fumigation

By DR. GEORGE H. CHAPMAN

American Cyanamid Co., New York, N. Y.

EDITOR'S NOTE: *Dr. George H. Chapman was appointed Assistant Botanist at the Massachusetts State Experiment Station in 1907. In 1921 he went to Puerto Rico to act as Research Director and Agricultural Manager for one of the large tobacco companies. In 1928 he was placed in charge of a projected tobacco development in the Hawaiian Islands. In 1934 he became affiliated with the Insecticide Department of the American Cyanamid & Chemcal Corp. as Special Representative in Industrial Fumigation. He is the author of some thirty papers in the field of plant physiology and biochemistry. He has had wide scientific and practical experience in fumigation work, which eminently qualifies him to discuss "Industrial Fumigations." The address was delivered October 1, 1934, before the Convention of The National Association of Exterminators and Fumigators, Inc., held in St. Louis, Mo.*

"Industrial Fumigation" is the term used to designate the fumigations carried on by the various industries in their factories and warehouses to control insect infestation in the raw materials and in the finished products.

There are three distinct types of industrial fumigations, only one of which usually concerns the commercial fumigator. These three types we classify as follows: (1) Warehouse and Factory Fumigation; (2) Atmospheric Chamber Fumigation; (3) Vacuum Chamber Fumigation.

The first, warehouse and factory fumigation, is the type which principally concerns the fumigator, and in which the potential field is great. The two others, atmospheric and vacuum chamber fumigation, which are comparatively small as yet, are usually carried on by operators employed in the factories.

An increasingly large number of industries are turning to fumigation as a means for controlling their insect problem, and including in their sanitation programs the periodic fumigation of building space in addition to treatment of the raw and finished materials.

It should be realized that there is a great difference between household and industrial fumigations, both as to volume and procedure. Usually it can be depended on in the case of factory fumigation that there will be a periodic treatment, either once or twice a year. This is the case because there is a constant stream of incoming raw material which may be infested, and during processing this very often will bring about an infestation in the factories. This repeat feature is not usually the case in household fumigation, except in the case of failures, or where there is a heavy turnover in tenancy. It necessarily follows that the unit charge per 1,000 feet fumigated should be much higher in the case of household fumigations than for factory fumigations. There is a considerable loss of effective time also in household fumigations which is not the case in factory fumigations. Unjustifiable claims for damage, etc., are also of much more frequent occurrence in household than in industrial fumigations.

The relative cost of labor, transportation, etc., per unit of gas used is also much greater than in industrial fumigations. Most of the so-called industrial fumigations will run from 150,000 cubic feet to well over 2,000,000 cubic feet, while in household fumigation the total volume rarely reaches the lower figure and usually approximates less than 50,000 cubic feet.

In addition, in household fumigation we have no considerable amounts of raw materials and therefore a smaller dosage is required. The types of insect infestation in the household are also different from those found in the industries.

Among the different types of industries at present utilizing fumigation to control insect infestations may be mentioned cigar, tobacco and cigarette factories and warehouses, chocolate and candy factories, nut processors, meat packing plants, dried fruit handlers, woolen and paper mills, carpet mills, macaroni factories, flour and rice mills and storages, grain elevators and miscellaneous seed supply houses, cold storage and furniture storage warehouses, and many others.

In connection with grain fumigation in bins, however, it should be pointed out that most grain men, owing to the simplicity of the application of the fumigant to the grain as it is running into the bins, elect to treat the grain themselves, after training an operator in the necessary procedure. In the mill, however, where large quantities of fumigant are used with subsequent opening and airing, very few care to handle the matter and prefer to employ the services of a professional fumigator.

Turning now to procedure in industrial fumigation, practically all fumigators utilize HCN in some form or other, as this gas has been found to be the best all-around fumigant, the most effective, and at the same time the most economical.

There are several forms in which HCN gas may be applied in industrial fumigations, among which may be mentioned:

PURE LIQUID HCN: 96-98% purity. This is supplied in cylinders and released in buildings through permanent piping or temporary hose, fitted with atomizing nozzles, and is the most convenient form of HCN to use in fumigating large areas, as the fumigator does not enter the building to distribute the gas, as is the case with other HCN.

ZYKLON DISCOIDS: These are liquid HCN absorbed in wood pulp and are also used in industrial fumigations, particularly when the space to be fumigated is small, comparatively speaking.

In certain types of structures one of the calcium cyanides is sometimes used. These are all powders and range in HCN content from 50-25%. They are applied by spreading in a thin layer on paper.

HCN may also be generated by the so-called pot method, using a mixture of NaCN (sodium cyanide) and H_2SO_4 (sulphuric acid). The materials used in this method are cheap, but the cost is materially increased by a large investment in barrels or pots, and the increased cost of labor and handling.

We now mention **sealing.** In our opinion 40% of the success of a fumigation is dependent on the efficiency of the sealing. This is particularly so as regards the sealing of the top floors of factories or warehouses. More partial failures result on top floors of buildings than anywhere else, and it behooves the fumigator to examine these areas most carefully, as there is great opportunity for leakage around roof supports, plastering, roof rafters, plates, etc. Skylights and ventilators are also another prolific source of leakage.

There are several sealing materials used, as we all know. The best one to use depends somewhat on temperature and humidity conditions in the building to be fumigated.

Flour paste and thin paper, heavy grease and paper, so-called Scotch tape, and adhesive tape are among the materials ordinarily used. Where much humidity is present, the tapes and gummed papers cannot be used with any degree of success and the flour paste, grease, or asbestos preparations must be used. A very good agent for sealing cracks around windows, etc., is made up from flake asbestos with sufficient water and a little calcium chloride to keep the mixture moist so that it will not dry during the fumigation and loosen. Some millers make a paste of condensed flour and oil which seems to work very well. In all cases in offices, etc., the tapes are preferable to use as they can be removed without damaging the paint in any way.

The success of a fumigation, aside from the proper sealing. depends to a great extent on the application by the fumigator of a proper dosage of HCN in the building to be fumigated. This is a matter that requires great discrimination on the part of the fumigator.

In determining the type of structure plays an important part. In addition, is the space to be fumigated empty or with only a nominal amount of raw or processed material present. Is the type of material highly adsorptive or not? In the case of packaged material, will the packing permit of penetration under atmospheric fumigation pressures. Is the amount of such material so great that it is necessary to compensate for adsorption in addition to the lethal dosage necessary to apply.

While there is a considerable amount of data available in dosages to use for different materials, the fumigator himself should use his own judgment in the matter based on experience.

It is always good policy to go over the problem carefully with the prospect, explaining clearly and honestly the difficulties which may be encountered, and showing the improbability of giving a 100% guarantee of kill. Most of the clients for this type of industrial fumigation are well informed men, and do not expect the impossible, as is so often the case with the householder.

While in most instances an eight-ounce dosage of HCN will be found sufficient to obtain a commercial kill, with commodities like tobacco, wool, packaged cereals, etc., it is necessary to increase the dosage to one pound, one and a half pounds, and oc-

casionally even higher, to obtain effective results. The speaker has in mind a wool fumigation made by one of the largest and best fumigators in which twenty-four to thirty ounces of HCN were advised, and good results obtained.

As has been indicated, while there are many forms in which HCN may be used, in industrial fumigations the piping of a building with a permanent system of copper tubing, which, once installed, lasts as long as the building itself, is the most convenient and in the long run the most economical.

Usually the factory is willing to make the tubing installation, but in some cases where it is possible to obtain a three-year contract, it pays the fumigator to make the installation himself. Its cost is comparatively slight, not averaging over 15c per 1,000 square feet of building space. Usually in empty space it is not necessary to figure more than one spray nozzle to each twenty thousand cubic feet of space, but in buildings used exclusively for storage of raw materials, it is usually customary to use one nozzle for every ten thousand cubic feet of space.

One or more small compressors and a few inexpensive wrenches are all that are necessary to apply liquid HCN in this type of building fumigation.

Another type of industrial fumigation which is increasing is that developed for flour mills, and to distinguish it from the building piping system, has been designated the machinery piping system.

This is a system whereby each important piece of mill machinery is permanently equipped with a spray nozzle of special design. These nozzles are connected by means of small bore copper tubing to a common feed line or lines, which terminate outside the building. When the gas is applied it discharges directly into the milling machinery, creating a high concentration in the parts where infestation is likely to be greatest. At the same time a sufficiently high concentration is given off from the machinery to effect a thorough fumigation of the entire surrounding area. This is the reverse of the method in which the gas is applied within the building, trusting to diffusion alone to penetrate the milling machinery.

There are definite indications that the new machinery piping system will eventually revolutionize the scheme of mill fumigation. Heretofore millers depended on one general fumigation annually to carry them through the year, and this required a great deal of preparation, cleaning out, and opening in the machinery prior to fumigation. This machinery had to be re-assembled afterwards and this lost considerable in time and production. Also there was some loss of flour, as all that was removed was either destroyed or had to be sold as stock feed; and again, when operations were started, it was necessary to use a similar amount of flour to fill the spaces in the machinery as was there before.

With the machinery piping system, however, no dismantling of machinery is necessary. The mill can be taken over at the close of the day's work and opened next morning for airing. These differences, including time, flour-saving, etc., also lower dosage required, mean that a mill can have three fumigations for the cost of one by the building fumigation method.

Results obtained to date are highly satisfactory. There is:

No extensive cleaning, usually a two days' saving.

No loss of production time.

Three fumigations a year at same cost of one general fumigation.

Can be used in "loose" mill, of sheet iron, or wood construction where a regular building fumigation job would do no good.

High cost of piping is offset on account of no clean-up labor cost or loss of production.

Avoid excessively high temperatures in general building fumigation, especially where the ceiling height is great. It is preferable in such cases to use floor nozzles or arrange the nozzles so that their height above the floor will not be too great.

Also, where there is any large amount of material in storage, it has been found advisable to install a few small fans to promote circulation. Better results have been obtained under such conditions.

Excessive humidity also should be avoided as this tends to take up HCN and reduce the lethal concentration.

The second type of industrial fumigation noted above is the so-called "atmospheric chamber" fumigation. This is used not only in industrial institutions but by the commercial fumigator as well. This is the simplest type of fumigation chamber and is simply a gas-tight room with gas-tight doors, equipped also with an exhaust fan and in some cases with heating units. All fumigations are conducted at atmospheric pressure. The cost of such a chamber depends entirely on the size, but is not excessive. Usually the chambers are tin or asphalt lined.

The material to be fumigated is placed in the chamber, packed so as to permit of a reasonable amount of space between packages. The doors are then closed and the HCN introduced, in the case of liquid HCN. In the case of Discoids or calcium cyanide,

(Continued on Page 12)

EXTRACT FROM THE
BRITISH MEDICAL JOURNAL

An account of their campaign against rats in Beyrouth where bubonic plague has been endemic for more than a decade, is given by L. V. R. Jude and J. V. H. Lubet in Arch. de Med et de Pharmacie Militaires for February, 1934.

In 1920 there were sixty-two cases, in 1921 there were twenty, and in 1932 as many as forty-nine cases. Although rats were destroyed by the thousands by trapping, etc., it was realized that for a town with a population of 200,000 inhabitants something more radical must be done. Preliminary tests with the Ratin System were made and these having proved satisfactory a credit of 200,000 francs was provided for the application of the System in the whole of the city. In the course of one year three million baits were distributed. The exploration of certain burrows revealed many dead rats, whose bodies had dried up without smelling of decomposition. Though no exact figures could of course, be quoted, it was the unanimous opinion of the inhabitants that the rat population had been greatly reduced. During 1933 there were only four human cases of plague — a result which the authors are inclined to attribute to their vigorous campaign against Beyrouth's rats.

For full information address THE RATIN LABORATORY, Inc., 116 Broad St., New York.

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Moths and Moth Preventatives

By MR. A. SREBREN

Murray-Nickell Manufacturing Co., Chicago, Ill.

EDITOR'S NOTE: *Mr. A. Srebren is a graduate chemist having come to this country in 1920. For six years he was connected with Charles V. Sparhawk Corp. and also for a time with the Sherwood Petroleum Co., in the insecticide department. At present he is with Murray-Nickell Manufacturing Co., in Chicago, and holds the position of Chief Chemist and Manager of the Insecticide Department. His address was delivered at the National Association of Exterminators and Fumigators, Inc., Convention held in St. Louis, Mo., last October.*

Of all the household insect pests, the clothes moth does, undoubtedly, the most material damage. One can even go further and say that of all pests, excepting the rat, the clothes moth is of the greatest economic importance. This is true because the clothes moth attacks and destroys the most expensive of household materials, namely, woolens, furs, carpets, and upholstered furniture. The importance of this pest is well appreciated today as evidenced by an innumerable host of devices, remedies, and attempts to control it.

It is here, of course, that the exterminator "comes in." His duty as the watchdog and protector of humanity from all pests calls upon him to undertake and carry on the fight against the moths. Although handicapped by lack of proper agents for this, he, nevertheless, has been doing a very conscientious "job" of it in the past years. We believe that his efforts will be more effective in the future now that he can equip himself with dependable materials to fight the clothes moth effectively. Whether he has answered the challenge fully, however, still remains to be seen.

In the extermination of the moths, the two most necessary and important factors involved are:

Knowledge of the habits of the moths, and

The proper agent with which to combat them.

The purpose of this talk is to deal mainly with these two questions.

All of us are, undoubtedly, familiar with the fact that the flying moth or moth "miller" does not cause and cannot cause any direct damage to the fabric, for it has an imperfectly developed mouth and so cannot eat anything at all. It is, of course, potentially dangerous in that it lays eggs which hatch into the voracious larvae which cause all the damage, for they feed directly upon the fabrics. This fact, unfortunately, is not well known by the general public which continues to be fearful of the flying moth.

There are two species of clothes moths most commonly encountered:

The case-making moth, and

The webbing moth.

Both are equally destructive, but the webbing moth is the more common. They have like habits and characteristics and undergo similar changes under similar conditions. The distinguishing difference is that the case-making moth carries a case during its larva stage.

The clothes moth passes through four distinct stages of development in one generation or life cycle:

The egg,
The larva,
The Pupa, and
The adult.

The adult lays its eggs in and about materials subject to attack. From the eggs hatch the larvae or worms. These are very small and transparent at first but grow to a length of one-half of an inch and assume the color of the material upon which they feed, a factor which makes it difficult to discover them until after the damage has been done. The larva stage lasts, on the average, one hundred days. Cases are known, however, where this was extended to two years. This is an important fact to bear in mind **because it makes the damage by the moth larvae not just a seasonal affair but something to be dealt with the whole year.** Food and environment have a great deal to do with the length of this stage. The larva is most susceptible to outside influences which often cause it to go into a dormant state during which it does not feed but awakens later to resume the ravage. The larva stage of the life cycle of the clothes moth is the longest of all the four, and, as at this stage the larva is most lively, it accounts for the great damage done.

From the larva the moth enters into the pupa or chrysalis stage, commonly known as the cocoon, which lasts but a short time, eight days to four weeks, depending upon weather conditions.

From the pupa the full grown adult emerges. This is the flying moth or "miller" most commonly observed and feared, but as already stated, harmless. Its purpose in life, which is very short, seldom exceeding one month, is to lay eggs for the next generation. During the short egg-laying period, the "miller" apparently does not eat. It begins laying eggs before it is a day old and continues doing so every subsequent day of its life. It lays about 100 to 150 eggs in all, and then it dies.

The eggs are laid loosely upon or between folds. In loosely woven fabrics, they are laid among the meshes where they are held by the fibers until the larvae hatch. The eggs are very small, smaller than the head of a small pin. However, being white, they can readily be seen, resembling dandruff, when the material upon which they are laid is dark. The eggs hatch very readily in warm weather or in heated buildings. Under such conditions it seldom takes more than one week for them to hatch, but during cold weather as long as three weeks are required.

One can never stress the following points too strongly, so I repeat:

1. It is only during the larva stage that the damage is done. The misconception regarding the "miller" should be uprooted. A flying moth is like the smoke which, while doing no damage, indicates the presence of fire, the larvae, which should be dealt with.

2. The larvae feed only upon materials of animal origin such as wool, furs, feathers, carpets, and upholstery.

3. The length of all four stages of the life cycle of the clothes moth is subject to outside environmental influences and are often prolonged; but the larva, the destructive stage, is most readily influenced and is the longest, longer than all the three other stages combined.

4. Moths prefer darkness and quiet. That is why they are seldom found on articles in constant use but are abundant in trunks, closets and attics.

5. Moth larvae in modern, well-heated homes can be found at any time of the year; and, if undisturbed, cause just as much damage in the winter as in the summer.

The damage done by clothes moths has been of such magnitude that they have been long recognized as a menace and accordingly steps were taken to curb it. Constant watchfulness on the part of the housewife, coupled with frequent brushing, sunning, cleaning, and airing of fabrics have been used from time immemorable for moth control. Various odoriphorous herbs have been used to fight them. The common moth ball is known to every household.

Today the number of substances used and proposed for moth control is so large that only the tremendously costly damage done by the moths can justify it. The recent list published by the Department of Agriculture contains more than five hundred of these substances, each one recommended for various reasons to be superior than the others under certain conditions. Upon close examination of this list one can see that, according to the claim made for each of them, they can be placed into two distinct groups.

1. Those that will kill moth life and moth larvae when coming in contact with it.

2. Those that will kill moth and moth larvae when coming in contact and render the material treated "moth-proof" so that it is immune to the ravages of the larvae of the moth. We shall discuss each group separately.

The first group is composed of substances well known in the field of contact insecticides and of others which are rarely met. This group contains by far the greater number as compared with the second group. One cannot justifiably discuss each member of this group; but as they all have many similar characteristics and limitations, especially in the way they function, one can make certain general observations.

The general definition of the contact moth-killers is that they kill moth life only when they come in actual, direct contact with it regardless of whether it is accomplished in a solid, liquid, or gaseous phase. They will kill all moth life present upon the fabric treated when in sufficient concentration to insure general contact, but

such a treatment will not insure against re-infestation of that fabric. The limitations of such a control treatment are obvious and merit no discussion.

Some of the most common substances that belong in the group are the following:

The common moth ball, chemically known as naphthalene, has been used by the housewife for a long time. Naphthalene will kill moths when used in such quantities that by evaporation a saturated atmosphere of naphthalene fumes is produced. This is possible, of course, only in a tightly sealed container.

Crystals of paradichlorbenzene and camphor act in a similar manner and under identical conditions which limit their application. Often their use does not insure full protection even under the best of conditions. All three of these substances should be present in concentrations of at least one pound for every five cubic feet of space to be effective, assuming, of course, that the space is sealed from ventilation.

Most of the common insect sprays will kill moth life; but, being only contact insecticides, their effect is only temporary.

Cold storage offers protection against moth damage by inhibiting growth, but does not destroy it. Fumigation with hydrocyanic acid, sulphur, carbon tetrachloride, carbon bisulphide, and formaldehyde when in proper concentration will also kill moth life; but even these treatments do not insure against re-infestation.

The second group of materials, which are very few, are known as "moth-proofers" and claim that their use not only gets rid of all moth life present on the material treated but also insures under certain conditions against further damage of that fabric by moth larvae. In other words, they made the fabric immune to moth ravage, untenable to moth life. Such a claim, of course, immediately places them above the contact sprays and contact moth killers in usefulness, and, if the claim is substantiated by actual working results, the advantages of such substances over those of the first group are obvious and beyond question. They become then the ideal agent with which an exterminator can work with assurance that he can achieve guaranteeable results. Before considering each class of these "moth-proofers" individually, in order that we may be able to point out some of their limitations, we hereby give you what we consider the characteristics an ideal moth-proofing agent should have.

1. Of course, it should actually moth-proof the fabric treated with it.

2. It should be a contact killer as well and a moth repellent if possible. These are desirable although not necessarily essential, for it is the absence of the moth damage rather than that of the moths that is desirable.

3. Aside from imparting the moth-proofing quality to the fabric, the agent should not affect it in any other way. That is, it should not shrink woolens, harden leather or furs, stain, spot, discolor, or run the colors of the material treated, and should not affect the strength of the textile fibers.

4. It should be odorless and should not leave a residue on the fabric after the solvent has evaporated.

5. The moth-proofing quality imparted to the fabric should not be easily removed from it by washing, ironing, dusting, or vacuum cleaning.

6. It should be oil soluble and preferably in an oil which is light enough to spread rapidly throughout the fabric so that the whole material becomes easily and quickly impregnated with it.

7. It should be non-poisonous.

8. It should be reasonably priced so that it is within the reach of the average person and in order that it can be applied abundantly for complete protection.

Now, coming back to the discussion of the few "moth-proofers," we find that these form three classes or types:

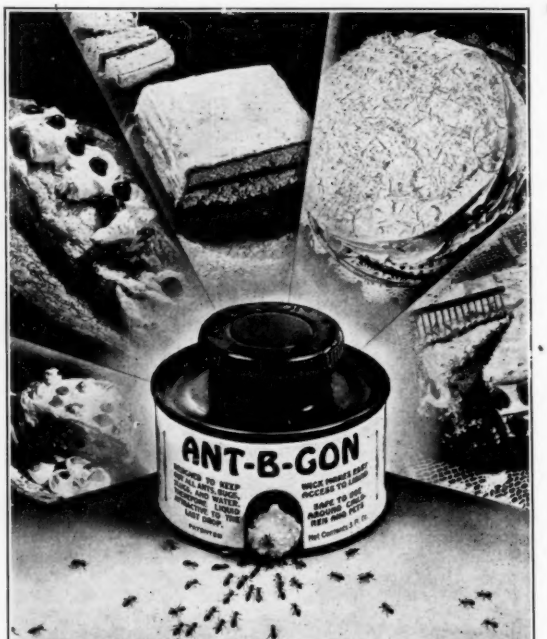
1. Various arsenical preparations.

2. Fluorides and silicofluoride solutions.

3. Oil soluble aldehydes, ketones, and glucosides.

The arsenic preparations are quite effective as moth-proofers and have been used effectively to a considerable extent. Aside from the objection that for good results quite a concentrated solution is necessary, the fact that all arsenical compounds, even in small amounts, cause chronic poisoning to humans, immediately places them at a serious disadvantage. At present, they are seldom, if ever, used or found on the market and in many states their use and sale is prohibited by law.

The second class of the moth-proofing agents, the fluorides and silicofluorides, also imparts moth-proofing qualities to the fabric treated with their solutions. The objection to their use is that they have to be applied in aqueous solutions, being insoluble in oils. Aside from the fact that the moth-proofing quality of a fabric treated with these substances is removed upon washing, there are more serious lim-



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itations to their use, namely, that most fabrics will spot, stain, shrink, harden, discolor, and run the colors when sprayed with water. Fur cannot be moth-proofed with these solutions without serious damage. Furthermore, as these substances act as stomach poisons and apparently have no repellent properties, the larva will eat fabrics treated as readily as untreated, but is poisoned, of course, causing some, although relatively small, damage.

The third and last class of "moth-proofers" are oil solutions of certain aldehydes, ketones, and glucosides usually finished in a light mineral oil of the naphtha range. They likewise impart moth-proofing qualities upon fabrics as the other two classes, but being oil soluble and not water soluble, they possess the following advantages: When properly prepared they will not stain, spot, shrink, or run the color of the material treated. These are the properties of all light mineral oils. The quality imparted cannot be washed off since the agent is not soluble in water, and can only be removed by dry cleaning.

Here may we digress from the subject for a moment to state that **no moth-proofer can withstand both washing and dry cleaning**, and any claim made to this effect is misleading and far from the truth, because a moth-proofer is either **soluble** in water or in organic solvents or both; but it cannot be **insoluble** in both for how would you apply it then?

Coming back to the oil soluble "moth-proofers," these are, because of the light base used, very penetrating and therefore impregnate the material readily and quickly. Everything of animal origin can be sprayed with it without fear that it will be injured in any way whatsoever. In this respect, they are similar to the common fly spray. Furthermore, they are moth repellents and moth killers because of the base used. They are non-poisonous and leave no residue upon evaporation.

We have come to the conclusion that an oil soluble "moth-proofer" comes very close to being an ideal one; and as these are very cheaply priced, we cannot see why they are not used more extensively by the exterminators.

In conclusion, does the professional exterminator take advantage of the daily growing field for moth-proofing jobs?

I have already stated why moth-proofing should not be considered just a seasonal affair. We are also familiar with the fact that moth-proofing has been grossly neglected by the exterminator. Moth-proofing is a very profitable field at present and will be so in the future, for even in the best of homes regardless of whether they are well screened or not, moths are always present or find their way into the house in some manner. Because of the serious damage done to expensive materials, the public is willing to pay well for the protection from their ravages. The housewife of today, aside from the fact that she is too busy doing other things to pay attention to moth control, could do very little alone, anyhow. **It is a job for the exterminator!** Now is the time for the wide-awake exterminator to grasp the opportunities of increasing his business and good will by embarking extensively in the field of moth-proofing with reliable moth-proofers to aid him. I hope that none of you will pass it by unconsidered.

"He that loses his conscience has nothing left that is worth keeping."

Insurance

The exterminating and fumigating industry is aware of the difficulties involved in obtaining satisfactory public liability insurance coverage, particularly during the last few years. It is true that many firms have policies, but the astonishing thing is that a study of some of these policies discloses that the policies do not actually cover fumigation and exterminating work. Many of the industry are proceeding with their work, confidently believing they are covered by insurance, whereas they have no coverage at all.

The industry has received a letter from Gilmour, Rothery & Co., of Boston, Mass., offering a policy for public liability insurance covering fumigation and/or extermination work that specifically gives the coverage that should be had. It was hoped by the Log that in this issue the definite clauses of the policy could be printed that ample proof could be had of this statement. No longer can this issue be held up but with the February issue and communications from the National Association of Exterminators and Fumigators more details will be given.

In the meantime, it is urged that firms throughout the country make application. Possibly the greatest value of the policy offered in addition to giving the bona fide coverage that the industry should have, is the added fact that the rates will have the official endorsement of the National Bureau of Casualty & Surety Underwriters.

To re-emphasize, it now appears that the policy offered is the best policy available to the industry through any source because:

1—It is a Fumigators' and Exterminators' policy written specifically for the industry, hence there can be no question as to its coverage of the work done by our industry.

2—The rates and minimums are lower than in any policy heretofore offered, specifically and surely covering fumigation and/or extermination work.

3—There are no strings attached in the form of restrictive clauses. The policy is available to any legitimate, competent fumigator and/or exterminator.

At first glance the rates and minimums may seem high or are not exactly computed along the lines that one is accustomed to have them computed. Even if these rates are not as low as the industry might wish, it can only be stated that an actual experience table must be evolved. If co-operation of the exterminators and fumigators is given and sufficient volume of insurance is written so as to make possible a fair experience, it can be assumed that with such favorable experience, the rates and minimums will be more attractive in the future. It is the industry that is "on the spot" and not the insurance companies.

The rates are as follows:

Fumigators

Limits: $ 5,000.00 any one person.
10,000.00 any one accident.

Rates: 10c per 1,000 cubic feet fumigated.

Minimum Premium Per Policy: $250.00.

Exterminators

Limits: $ 5,000.00 any one person.
10,000.00 any one accident.

Rates: 50c per $100.00 of gross income.

Minimum Premium Per Policy: $50.00.

Uses Clams to Exterminate Rats

George Steele, a clam-digger who lives at Sebasco, Maine, has worked out an ingenious scheme for keeping the big shore rats away from his modest home. Mr. Steele—known to his friends as "Cappy"—doesn't mind a rat or two around the place and has no fear of the rodents. But when they descend on his mounting pile of clam shells in gangs to drink the salty juice and pick up what meat they can find, the clam-digger plays Pied Piper in a most unusual way.

He doesn't post tabby cats about the place to stalk and kill the rats, nor does he set the familiar spring traps baited with cheese. He goes to one of his clam hods and picks out 25 or 30 of the biggest clams. Then he takes these seemingly dumb creatures and deploys them a few feet apart from his home to the low-water mark. He knows from experience that when he goes down to the shore in the morning he will find anywhere from half a dozen to a score of drowned rats.

Years ago "Cappy" Steele learned that clams have a healthy dislike for rats. He made this discovery while watching a big shore rat crawling over a pile of shells. Among the shells, from which clams had been shocked, was a good-sized live clam that had been overlooked. As the rat approached this clam, Mr. Steele saw the two halves of the shell slowly open.

The rat, coming upon this inviting morsel, thrust his nose between the two parts of the shell and promptly squealed in pain. He kicked frantically with his feet and lashed his long tail, but he was caught as in the jaws of a vice. Not until the rat was dead did the clam release its grip.

On one or two other occasions, the Maine Coast clam-digger saw the lowly clam demonstrate its rat-catching talents and that's why, when the rodents began to pester him, he conceived the idea of letting clams try their skill at trapping the pestiferous rodents and holding them fast until the tide came up to finish the job.

"Folks might laugh at the notion of clams catching rats," says the resourceful citizen of Sebasco, Maine, "but they do the trick and do it well. Give me a dozen big clams rather than a couple of cats any day. They'll do away with more rats and make a neater job of it. Cats leave the carcasses around, but the clams do their work on the flats and the tide comes in and takes the bodies of the pests away.

"Until you see a clam outsmart a rat," says Mr. Steele, "you wouldn't believe how slick they work. A clam doesn't have to catch a rat by the nose. I've seen rats nipped by the tail and by one foot. And once the clam shuts its shell there's just no breaking away." — Magazine Section, Los Angeles Examiner-American Weekly.

Industrial Fumigation

(Concluded From Page 8)

the fumigant is scattered on the floor and on the material and the door then closed. A gas mask is used during the application when these forms of HCN are used. With liquid HCN, however, the gas is introduced through piping to the chamber from outside.

Fumigation of large quantities of flour, cereals, tobacco, etc., may require 24 to 36 hours for satisfactory results. On the other hand, the commercial fumigator treating rugs, clothing, furs, furniture, etc., will obtain a satisfactory result with an eight-hour fumigation, if proper dosage is used. This will vary from eight ounces to one pound per thousand cubic feet, depending on the density of the material to be treated and the quantity involved.

There are several units on the market adapted for use as atmospheric chambers, but their cost is relatively high. Most of the HCN manufacturers will gladly send type blueprints, which will enable the fumigator to get quotations on any size from local contractors. In many of the larger centers a considerable amount of what might be called "retail business" may be secured by the fumigator having such an installation.

The third type of industrial fumigation which is rapidly growing in importance, but which is principally confined to manufacturers in their own plant, is known as "vacuum fumigation."

This is really chamber fumigation also, but differs from atmospheric chamber fumigation in that the process is carried on under reduced pressures, in other words in the absence of air. The material to be treated is placed in heavy steel chambers capable of withstanding an external pressure of fifteen pounds to the square inch, the doors are then sealed and the air pumped out of the chamber and the material. The fumigating gas is then admitted and remains in contact with the material in the chamber for a period of from two to three hours. At the end of the exposure period the chamber is again evacuated and the air allowed to rush in. This is known as "air washing." After one or more air washes the material is removed from the chamber completely sterile.

It will be noted that the gas is applied without being mixed with air—and as a result the time of fumigation can be shortened greatly.

In addition to the time saving, owing to the reduced pressures, a more complete penetration by the fumigant is obtained and it is not unusual to find tight wrapped cellophaned packages being treated with perfect success.

Vacuum chambers vary greatly in size, from small ones of two or three hundred cubic feet capacity, to huge affairs which will hold entire freight cars and their contents. Vacuum fumigation is of advantage particularly to manufacturers for use in the fumigation of finished and packaged food products, such as rice, cereals, dried fruits, tobacco, etc. The manufacturer can be absolutely certain that his product will not contain live insects or their eggs.

The initial cost of a vacuum fumigation with its accessories is relatively high but this is compensated for by the reduction in amount of returned goods, and there are several instances on record of an installation paying for itself in one year.

In vacuum fumigation a greater portion of the fumigant is adsorbed naturally, but HCN has the peculiar advantage that it is released rapidly after fumigation, and does not combine chemically with foodstuffs as is the case with many other chemicals. Tests on a variety of food products such as fruits, nut meats, candies, flour cereals, dates, fresh meats, etc., have been made and no trace of HCN found after complete aeration. Millions of pounds of foodstuffs have been fumigated with HCN without a single known instance of any human being having been harmed by eating fumigated food.

Vacuum fumigation is in its infancy, but the manufacturers are assigning more and more importance to it, and as they realize its importance they at the same time recognize the importance of factory insect sanitation and this makes for an increase in factory and warehouse fumigation which is the field the commercial fumigator is interested in.

An intelligent survey of any locality will indicate the possibilities and proper intelligent approach and discussion with the factory management will often result in a contract that operates to the benefit of the fumigator and the client.

One thing must be kept in mind, however, in industrial fumigation there can be no over-charging, no bluffing—usually the client is as well or better informed than the fumigator. An honest job at an honest price.

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5. All Rubber Powder Bellows
   Small **$4.25** doz. Large **$5.25** doz.
6. Bed Bug (Proofing) Liquid **50c** gallon.
7. Roach Powder, ready to use, **40c** lb.
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Evaluation of Insecticidal Products

By ROBERT M. MUELLER

Secretary, Research Laboratories, Inc., Cedar Rapids, Iowa

EDITOR'S NOTE: *Robert M. Mueller, Secretary of the Research Laboratories, Inc., of Cedar Rapids, Iowa, is a graduate of the University of Iowa City in 1929. He is continuing with his work in Chemistry, Botany and Entomology. The Research Laboratories, Inc., are Western sales representatives of Rohm & Haas, Inc., of Philadelphia, Pa., who are owners and manufacturers of a chemical synthetic insecticide, Lethane 384. The officials of the Research Laboratories, Inc., have had years of experience in the manufacturing and marketing of botanical insecticides previous to their connection with the Rohm & Haas Co., Inc.*

At the time that your committee suggested to us that we appear upon this program to discuss the evaluation of insecticides, it occurred to us that any discussion of this subject should start with at least a brief review of the history of insecticides, giving you in short the early methods of testing, and developing them down to the present-day standard accepted test, the Peet Grady Method. The references made herein to this method of testing we obtained from Doctor C. H. Peet, whom we hold in high regard and admire greatly because of his thoroughness and scientific knowledge in this particular field. By many, ourselves included, he is recognized as one of the foremost authorities in the country on insect control and insecticidal products.

Primitive man apparently made no effort to control insect pests. However, earlier civilization saw various physical means such as cloth screens, fans, brushes, etc., and even some chemical means such as annointments were used. We find that the first definite steps towards insect control appear to have been discovered by the Crusaders. They found that the powdered flower of a specie of daisy was being used in the Holy Land to kill lice and they, therefore, adopted this method for ridding their blankets, clothing, etc., of these pests, carrying back to Western Europe the reputation of the Persian Insect Flowers.

These flowers, since known as Pyrethrum Flowers, constituted a fairly staple article of commerce, but it was not until the American passion for cleanliness began to manifest itself that an especially marked demand for pyrethrum flowers began to develop. Up to this time the flowers had been used only in powdered form and the principal source of supply was the Northern Mediterranean countries.

Some early work has been done on extracting the active principle from these flowers, but it was not until about 20 years ago that liquid insecticides made from pyrethrum flowers began to appear on the market in quantities. They were well received because of their more rapid action, besides the user preferred liquids to powders. Alert experts of the Japanese government discovered that the cultivation of the pyrethrum plant was well adapted to the climate and soil conditions of the Japanese Empire and almost before the world realized it the pyrethrum industry had moved from Southeastern Europe to Japan.

In the usual course of trade buyers discovered that they were receiving batches of pyrethrum flowers which aroused complaints from their customers on the score of ineffectiveness. They, therefore, sought some means by which the quality of a given shipment might be judged. The earliest tests consisted substantially in merely examining the flowers to determine whether or not the shipment was primarily of flower heads or whether it contained a considerable amount of stems and leaves. These latter parts, as you know, are inert, since the active principle of the pyrethrum plant is found only in the flower head itself.

This physical examination proved unreliable, for it developed that lots consisting only of flower heads were still insecticidally unsatisfactory. Accordingly, other crude methods were used to determine the value of a given batch of flowers, the commonest of these consisting of dropping one or more cockroaches into a small bottle containing a few grams of pyrethrum powder. The cockroach and the powder were then shaken well, and the roach was emptied onto a flat surface. The time required to paralyze the insect was considered a measure of the effectiveness of the powder under test. Such methods also proved unsatisfactory for there was no allowance made for the resistency of one cockroach over another.

By and large, the insecticide situation was not in a very good condition and the opportunity existed for someone to work towards the elimination of the difficulties which appeared due to the lack of uniformity of pyrethrum flowers, and nearly 10 years ago the Rohm and Haas Company, Inc., of Philadelphia, Pa., began to work on this problem. From their past experience in the chemical field this company knew that the control of natural products is a very difficult matter and that synthetic products are free from the criticisms which are leveled at natural products.

One of the first problems which the company faced was the measuring of the insecticidal effectiveness, with reasonable accuracy. This was necessary not only in order that they might know what the products which they were developing would do, but also that they might be able to compart the effectiveness of these synthetic products with that of the insecticides which were made from pyrethrum flowers.

After reviewing the situation, their entomologist was of the opinion that a modification of the cockroach method would be the most reasonable, and, accordingly, a method was worked out whereby cockroaches could be reared in quantities and efforts were made to work out a testing procedure involving these insects. The outcome was, however, unfavorable.

Many other insects were then considered, among them the fruit fly, the mosquito, bees and others, until finally attention was centered on the ordinary housefly (Musca domestica). One of the reasons for this was that it was thought that the consumer would be more apt to use this insect in determining the effectiveness of an insecticide, for to him flies are probably the most common and most annoying of insect pests.

A suitable temperature-controlled insectary was built, and jars of horse manure inoculated with fly eggs were placed therein. Flies emerged in good quantity until about the middle of December, when they petered out with no evident cause. An investigation was started to determine how flies could be made to grow in winter and it was found that Dr. R. W. Glaser of the Rockefeller Institute for Medical Research had reared flies through the winter by the addition of a small amount of yeast to the food supply.

With quantities of flies available, a new difficulty appeared in the form of an attack of minute parasitic mites. These sapped the strength of the flies, rendering them of less value for test purposes. However, this difficulty was overcome by selecting a good supply of paupae, which, as you know, are the little brown cylindrical cocoons in which the fly larvae rest themselves for a period before they emerge as adult flies, and washing them in a dilute solution which carried off the mites. They were then removed to a sterilized chamber and a fresh generation of flies, free from mites, was at hand.

In the beginning no particular attention was given to the condition surrounding the flies; that is, the temperature was not held at any definite point. It was soon learned that this was of vital importance and that an optimum temperature was needed. At a temperature of around 50° F. most insects are dormant. At 60° to 65°F. the maturity of flies is retarded, and besides they are more resistant to insecticides. At temperatures in the 90's they develop more rapidly, but they are more easily killed. Further tests revealed that a temperature of 85°F. proved satisfactory and could be maintained with fair ease both winter and summer, and therefore this was selected as the standard at which flies should be kept and tested.

In the beginning, insecticides under test were sprayed on flies in small cages of about 8 inches by 10 inches on an edge, made of window screening. Several flies, perhaps 20 or 30, were placed in these cages and the insecticide sprayed through the screen upon the flies. Such tests proved unsatisfactory, besides inconsistent, in that almost all tests showed abnormally high kills. It was obvious that this method of application was too severe, for it practically drenched the insects sprayed. Attempts to apply a lighter dose resulted in such a wide variation in results that these small cages were abandoned and a couple of substantially larger cages were tried out, but the tests again were not uniform. It was finally decided that a chamber would be used which would be more comparable in size with a room in a dwelling house or

storeroom, etc., and accordingly a 6-foot cube chamber was constructed. This permitted a more even distribution of the insecticide, even in the corners, and it was found to be satisfactory, and accordingly was adopted as standard.

In the beginning a hand atomizer was employed to spray the insecticide into the chamber and the use of various dosages resulted in the selection of 12 ccs, as the standard amount to be used for each test. In biological terms, the most accurate point in a biological test is the 50% point, i. e., where killing power is to be determined, the greatest accuracy will be obtained when enough of the insecticide is sprayed to give a 50% kill. Now, for practical purposes it was found to be impossible to adjust the amount of spray in each test to give exactly this figure, so when it developed that 12 ccs. of the average insecticide gave kills of approximately 50%, the amount of 12 ccs. was adopted as the standard amount to be used in each test.

Variations in results when 12 ccs. of the same spray were sprayed in successive tests indicated that some other factor besides quantity of insecticide was effecting the results, and it was determined that this factor must lie in the fineness of the mist produced by the atomizer. Unfortunately, with the ordinary hand atomizer it was impossible to get uniform droplets, so it was thought that this could be overcome with a uniform air pressure. Accordingly, air pressure equipment was installed and tests showed that the best kind of spray was obtainable when the air pressure on the atomizer was 12½ pounds per square inch. Accordingly this was adopted as standard.

Other necessary refinements followed and were added to the test. Meanwhile, various laboratories became interested in Doctor Peet's testing procedure and through their cooperation certain further refinements were added, all directed toward the elimination of as many variables as possible, until finally the completed method, as published in the April, 1932, number of SOAP, was adopted by the National Association of Insecticide and Disinfectant Manufacturers as the standard testing procedure.

It is worth pointing out that although this method is widely used and is generally conceded to be the most dependable, nevertheless it is subject to the variations which attend any biological test. It may be a blocked atomizer line, some peculiarity of the insecticide, or some other such similar variation. These are experiences which are common to biological workers and because of the various angles involved it is nearly absolutely necessary that the tests be conducted by trained and competent entomologists.

After the application of the insecticide the flies were carefully observed and it was noticed that the effect of the spray was not instantaneous, but rather that time was required for the lethal dose to accumulate within the system of the insect. When this amount had been absorbed or inspired, paralysis followed and those sufficiently paralyzed never recovered. The period of recovery varied, but it was observed that very few seemed to revive after 24 hours.

Accordingly, it was decided that a test should show two things: (1) The speed of action, and (2) The percentage of kill.

(1) The speed of action was established by determining the percentage of flies paralyzed during the first ten minutes after application of the insecticide.

(2) The percentage of kill was established by determining the percentage of flies remaining motionless 24 hours after application of the insecticide.

In this connection it should be mentioned that in order to eliminate any factors of personal judgment, only those flies which are absolutely inert after the 24-hour period has passed are considered, for testing purposes, dead. If the fly moves its legs or wings ever so slightly it is considered to be alive.

This subject has been presented from the historical and informative point of view rather than from the technical angle, and I feel that perhaps this whole testing business could be made a bit more clear to you as manufacturers of insecticides if I gave you a brief summary of an extended series of tests which were completed some time ago on a number of different insecticides. I am sure that I am disclosing no secret when I say that by far the greatest number of insecticidal sprays consist of either a kerosene extract of pyrethrum flowers, or of a kerosene solution of Lethane 384, or a mixture of both, since they are perfectly miscible.

To determine the relative effectiveness of the pyrethrum insecticides, 10 different extracts of pyrethrum flowers were prepared, using 10 different lots of flowers. They were thoroughly extracted in the proportion of 1 gallon of a good grade of kerosene to

(Continued on page 17)

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War Waged on Insects with Lights and Odors

Orchards and Garden Vegetables Protected From Pests by Strange Traps and Processes

By ROBERT E. MARTIN
(Courtesy Popular Science Monthly)

Electric lights, screen doors that electrocute anything attempting to fly or crawl through their meshes, and mechanical traps that lure their victims by means of odors are among the newest weapons to be used in the warfare against insect pests. Such devices make summer porches inhabitable, increase the yield of such fruit crops as apples, keep flies from injuring stock, and provide abundant food for fish in outdoor ponds.

A professor in a midwestern college found it impossible to remain comfortable on his screened-in porch in summer because of the mosquitoes and other insects that were attracted by the lamps on the porch. He placed a brilliant lamp outside, beneath the eaves and not far from the screenwire. At once the insects began crawling through the screen or, if too large, collecting on it, in an effort to reach the bright light. The professor is now able to read his books in peace because his dimmer, shaded lamps no longer act as bug magnets.

Light-trap experiments of the New York State Agricultural Experiment station at Geneva, performed in apple orchards at Hilton, point to a new way in which the fruit grower can realize greater profit from his trees. Similar studies have been carried on in other parts of the country, with promising results. At the present time, this work is not complete, so that conclusions drawn from the results of tests may need later revising.

The New York experiments consisted of lighting parts of an orchard with lamps which formed portions of traps, leaving other parts unlighted for the purpose of checking results. Some of the trees were sprayed with chemicals commonly used for insect control, while others were not treated.

Three different lighted areas were used. In one, water-pan traps were placed in every tree. In the second plot, water-pan traps were placed in every second tree in every second row, making one trap for four trees, or twenty-eight traps in four acres of orchard. The third area, containing forty-four trees, had, in every tree, a type of trap that electrocutes insects as they pass between its bars in an effort to get near the lamp inside. The water-pan traps were hung from the larger limbs, two or three feet from the trunk. The electric traps were suspended from the tops of the trees.

From June 1 through August 4, 1932, all of the traps captured 8,782 codling moths, 43,321 bud moths, and 72,928 fruit tree leaf rollers, all of the insects being decidedly injurious to apples.

Examinations of captured insects during the several years that the trapping work has been carried on have revealed that there were about an equal number of males and females, and that many of the females had not yet laid eggs. It is believed also that the mere presence of lights reduces the amount of egg laying, and thus reduces the crop damage later in the season.

The number of insects captured does not necessarily measure the value of the trapping activities, according to Donald L. Collins, who has been carrying on the work at the New York station. The actual, dollars-and-cents benefit can be determined only by comparing the fruit yield of the lighted orchard with that of a similar unlighted one.

At the New York orchard, apples which had dropped from the trees were picked up and examined. The 400 apples still on each tree were checked. Examiners inspected each apple carefully, noting the number of stings, the number of deep codling moth injuries or worm holes, and whatever other damage had been done by insects to the ripening fruit.

Counting both apples on the tree and those that had dropped to the ground, the following facts were obtained:

Clean or undamaged apples per 100 apples, 67.15 in lighted areas, and 37.04 in unlighted.

Number of apples having worm holes, per 100 apples, 11.83 in lighted areas, 26.76 in unlighted.

Number of worm holes per 100 apples, 16.13 in lighted areas, 47 in unlighted.

These figures, together with others obtained at various times, indicates that lighted orchards yield about 30% more uninjured apples than unlighted ones; that there are twice as many apples containing deep worm holes in unlighted areas as in lighted ones, and that almost three times as many worm holes occur in unlighted sections as in those which are lighted.

Further experiments were carried out to find the best combination of light and chemical sprays. Some trees were lighted but not sprayed, some were lighted and sprayed, others were sprayed but not lighted, while others were neither lighted nor sprayed.

A surprising result was that trees which were lighted but not sprayed produced apples having about the same number of worm holes as trees which were sprayed but not lighted. Apples from the unlighted, unsprayed control trees showed twice as much injury as either of these, while trees which were both sprayed and lighted were about three times as good as the unsprayed —lighted and unlighted—sprayed trees; and were six times as good as trees which had received neither kind of protection. These conclusions are based, by Collins, on figures showing extent of codling moth injury, or the number of deep worm holes.

Figures so far obtained at the New York experiment station indicate that the use of light traps among apple trees reduces to a considerable extent the amount of injury by the codling moth. Tests which have run over four-year period in one area indicate that the use of light traps decrease the codling moth injury each year over that of the previous summer. The discovery that the use of incandescent lamps is as effective as the use of sprays in the control of codling moth injury surprised investigators and has led them to make further careful studies along these lines with various kinds of lights.

Collins has issued a reminder to fruit growers that his experiments are not to be taken too seriously, until they have been carried on through a sufficient number of seasons to make the results reasonably certain if correct technique is used.

"However promising these figures may appear," he says, "we do not yet consider ourselves in a position to make definite recommendations. It is hoped that another year's experiments will settle any doubtful points."

The adoption of a new electric screen door would make life more comfortable for thousands of cows and horses by destroying the flies that pester them.

The new fly-killing door works on the same principle as the electric insect trap used in the New York orchard experiments. The upper part of the door is well covered by a double grill, each half of which is conected to a high-voltage coil or transformer. Passage of a fly through the grill reduces the insulated distance between two of the metal strips and causes a spark to jump through the insect's body. Electrocuted flies drop into a trough from which they are emptied at intervals. Such doors, which are harmless to anything but an insect or spider, can be used on residences as well as cow barns. Operation cost is low.

Another form of electric light insect trap is providing food for fish in an Ohio state hatchery. A large electric lamp is suspended a few feet above the water, in the center of the fish pond. At night, insects congregate about the lamp by the thousands. Many of them drop into the water, and provide abundant food for the fish. This system can be used in connection with any garden pool. Besides having a dollars and cent value by providing fish food, it keeps insect pests away from porches and other places. For a moderate sized pool, a seventy-five watt lamp is sufficient.

Mechanical means of capturing insects do not all depend on the use of a bright light source. Some of the most valuable work is done with baited traps, the bait being some substance which attracts the victim by means of an irresistible odor.

The U. S. Department of Agriculture has carried on extensive studies of the control of various insect pests by means of traps. Congress appropriated considerable money for large-scale bait-trap experiments with the Oriental fruit moth which causes extensive damage each year.

Experimental areas were established in Georgia and Indiana, and traps were set out, baited with various substances. Such traps, according to Bureau of Entomology experts, need not be elaborate—a simple fruit jar being effective. The best baits were found to be oil of anise, ethyl cinnamate, terpenyl acetate and oil of mace.

Results of the experiments in Georgia and Indiana indicate that damage done by the fruit moth can be reduced fifty per cent or more by using traps over large areas, in half of the trees. In Northern Georgia it cost an average of $8.00 an acre

to maintain traps for one season over a large area. This includes allowance for depreciation and other expenses.

The Oriental fruit moth studies included marking moths, liberating them, and then recapturing them with traps. An average of fifty per cent in recaptured insects has been reached, and in some cases all of the liberated moths were caught. Some were captured more than a mile from the point where they had been liberated, indicating that trapping, to be effective, must not be confined to a single orchard, but must be extended over a large area.

The Japanese beetle, which is expected to extend its destructive activities over the whole of the United States, and which makes a specialty of attacking well-fertilized grass plots such as lawns and golf courses, can be most effectively controlled in localities where the infestation is light, by traps used in conjunction with soil treatment.

If you visit Washington, you will see, in parks, on the lawns of government buildings and elsewhere, devices that look like a bucket hung from a steel standard, and equipped with a glass jar at the base and white vanes at the top. These are Japanese beetle traps, of which thousands have been put into use during the past five or six years. The principal purpose of the trapping in Washington is to determine the distribution of the beetle. However, it is now possible to reduce the beetle population considerably by the use of such traps over a wide area. If placed on only a small plot of ground, they may serve to increase the trouble by attracting pests from neighboring, unprotected regions.

The trap developed at the Japanese beetle laboratory consists of a funnel enclosed inside a sheet metal cylinder and emptying into a glass fruit jar. Around the funnel, near the small end, is a perforated ring holding the bait. At the top is a vane made by mounting two flat pieces of metal at right angles to each other. Experiments have shown that the best color combination is light green for the cylinder and white for the baffle and inside of the funnel. The glass fruit jar, into which beetles fall, has a small slit cut in the bottom to let water out. The Japanese beetle bait found most satisfactory includes geraniol, eugenol, bran, water, molasses and glycerin. While some owners of property infested with beetles may choose to make their own traps, approved devices can be purchased in several regions, at prices ranging from ten cents to $2.50.

It may be that, in the future, effective insect traps which employ a musical note instead of light or odor-producing bait may be available. Prof. Elihu Thompson of the General Electric Co., has developed a vibrator which imitates the mating call of a mosquito, attracting those insects in considerable numbers. Doubtless further research along this line will be carried out, with the hope of making the principle useful to the large army of fruit growers.

When engineers of the General Electric Co. were developing a new type of hot-cathode neon lamp, they found that, when the red neon lamp was burned at night together with others such as mercury-vapor lamps and incandescent bulbs, insects collected around all lamps except the neon. This was believed, at the time, to indicate that red light does not attract insects. Perhaps the characteristic neon color is one that is unattractive, and even repelling, to the flying bugs. No experiments were made to determine whether ordinary red-globe incandescent lamps produce the same results.

It may be that, by burning only red lamps on the porch, you can eliminate mosquitoes and other pests from your list of summer worries. Ordinary red incandescent lamps can be purchased almost anywhere, and cost considerably less than the hot-cathode less power, so that its operating cost over neon lamp; but the neon bulb consumes a long period may be low enough to offset the higher first cost. Probably the size of the installation would be the deciding factor.

The use of mechanical devices for fighting off insect pests is so new in the fruit-raising business and other activities that it may be considered as still in the experimental stage.

The Asiatic garden beetle which attacks asters and other plants can, according to the U. S. Department of Agricultulture, be captured in considerable quantities by light traps which consist of four-foot funnels having 500-watt electric daylight bulbs above a can containing water covered by a kerosene film, below. However, considerable adidtional work must be done before the value of such traps in control work is known, so that their use is not recommended by the Department.

The most promising traps, according to government investigators, seem to be those using bait that has an attractive odor. Most of the experimental trapping done in the past has been with devices of this kind.

The Essence of Science is to discover identity in difference.—F. S. Marvin.

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Evaluation of Inseticidal Products

(Continued from page 14)

1 pound of flowers, which, as you know is the usual recommendation for the best grade of pyrethrum insecticide. Without going into detail and giving you the results of each individual test I will summarize them briefly:

Material: Pyrethrum Flowers

	No. of Tests	Per Cent Down in 10 Mins.	Per Cent Dead After 24 Hrs.
Sample No. 1	10	88	54
Sample No. 2	10	94	59
Sample No. 3	10	95	59
Sample No. 4	10	93	60
Sample No. 5	10	96	63
Sample No. 6	10	96	63
Sample No. 7	10	96	65
Sample No. 8	10	99	73
Sample No. 9	10	99	73
Sample No. 10	10	98	79

It should be noticed that the percentage of flies down in 10 minutes ranged from 88% to 99%; and that the percentage of flies dead after 24 hours ranged from 54% to 79%. The average knockdown was 95% and the average kill was 65%.

As manufacturers of insecticides this sort of information should be of particular importance to you, for how are you to determine whether any given batch of flowers which you will receive will give you a kill comparable to the high 79% or to the low 54%? I believe that most manufacturers are aware that this condition still exists.

A similar series of tests were run on the six principal commercial pyrethrum insecticides with results as follows:

Material: A Leading Commercial Insecticide

	No. of Tests	Per Cent Down in 10 Mins.	Per Cent Dead After 24 Hrs.
Sample No. 1	15	99	60
Sample No. 2	15	98	63
Sample No. 3	15	99	66
Sample No. 4	15	99	68
Sample No. 5	15	99	71
Sample No. 6	15	99	73

It should be noticed that these commercial pyrethrum insecticides avoided the low point reached in the previous test, namely 54% kill—but, it should also be noticed that they failed to reach the high kill previously obtained, or 79%. However, the average kill in these tests was approximately the same as in the tests before mentioned, 65%.

The other outstanding material, as you know, is Lethane 384, and it is recommended to manufacturers for use in a 4% solution, that is, a mix of one part of Lethane 384 and 24 parts of a suitable base. In a series of tests similar to those referred to above the average results were as follows:

Material: Lethane 384

	No. of Tests	Per Cent Down in 10 Mins.	Per Cent Dead After 24 Hrs.
(4% solution in kerosene)	39	100	80

I want to call to your attention the fact that this knockdown was achieved in approximately 3 minutes, rather than the customary 10.

Some variation from this showing is to be expected on duplicate series of tests due to the inherent variations in biological testing with flies, but we have never obtained a knockdown of less than 100% and a kill of less than 75% when using a 4% solution of Lethane 384 in a suitable kerosene base. Naturally, lower concentrations will produce lower kills.

The kill is the only requisite of the insecticide code on household sprays, but it is only ONE characteristic which should concern a manufacturer. There are other merits which most certainly influence the customer in his purchase, such as rapidity of action, more certain and never-varying killing power, repellency, complete and standardized uniformity, and all around general effectiveness. Therefore, it behooves every manufacturer to seriously consider all of these factors when preparing his insecticidal products.

I want to leave with you another imperative thought, that is, that in the preparation of your formulae, the more scientific the materials you use therein, the more dependable, the more reliable, and the more satisfactory will be your finished products, especially if such scientific materials are the result of years of careful, thorough, and intensive research, conducted by an old organization with competent and able scientists. Certainly you can expect more from such synthetics than you can from products which, by the grace of nature, happen to possess certain favorable properties.

Mouse Triumphant

Erie, Pa.—Employees at the Hammermill Paper Company's plant are telling about the mouse that killed the cat. The cat, they say, nabbed the mouse and toyed with it for a while before making the kill. As the cat opened her mouth to seize its prey, the tiny mouse slipped down the cat's throat, and died triumphant as the cat choked to death.

Local Organization News

The New York Society

Upon the completion of 1934, we view with interest the activities of the past twelve months. To set forth the problems and achievements of 1934 would be interesting, but we shall confine ourselves to the brief mention of those which we feel would prove of interest to others outside our city.

With pride we note that not one fatal accident occurred in this city, as the result of the work of any of our members or their employees.

Early in March a banquet was held in Hotel New Yorker, attended by over a hundred members of our industry. Speeches were made by members of the U. S. Public Health Service, U. S. Department of Agriculture and the Board of Health. This annual banquet is looked forward to by all members of the industry, and each year commands an increasingly impressive group of speakers.

Much time and effort were expended in the matter of the proposed code for our industry. Within the jurisdiction of this Society, there are approximately twenty-five per cent of the firms engaged in our business in this country. The period preceding and following code hearings resulted in numerous requests from individual firms for specific information. Co-operative work was closely done with the officials of the National Association on this very important matter.

The government in its endeavor to provide work for unemployed, advanced plans for an extensive rat control project in this city. Prompt presentation of our protests before the proper officials resulted in this work being so directed that our industry suffered no financial loss. Indeed, I venture to state that while this work is going on every day in our city, it is being done in such a manner that the majority of the firms in this city do not know of its existence. This problem, however, shows evidence of recurring in a manner that causes concern, but we are hopeful that we may again succeed in having it properly directed.

This Society endeavors to obtain technical information of value to its members. During the past year we have distributed a bulletin on the use of Carboxide by Dr. Brown, U. S. Navy. Papers on the use of methyl or ethyl formate, U. S. Bureau of Mines. Papers on Termites by Dr. Snyder of the U. S. Department of Agriculture, as well as calling the attention of members to various other papers.

Taxes have been the scourge of almost every industry. We recognize their necessity, particularly in these trying times. We also are aware that once these extraordinary taxes are imposed they are seldom removed. We, as an industry, have been most fortunate in not having any such special taxes imposed.

Licenses in this city for owners show a decrease of about twenty per cent over 1933. Licenses for employees show an increase of about five per cent over 1933; which clearly indicates an increase in the use of our services. It is an unfortunate truth that due to increased and intense competition, with resulting reduction in prices received, offset the financial benefits which should accrue from this increase. This is a problem that is indeed difficult to cope with.

In March, 1934, dues for local membership were increased to sixty dollars per year, payable on a monthly basis. While this resulted in few resignations, it has been compensated for by new memberships, which, in view of a decrease of twenty per cent in owner operators, is indicative of the strength of our Society.

With the New Year, we are confronted with definite problems, at least one of which may have far reaching effects on the industry. We face these problems with the confidence born of past experience.

On behalf of the Officers and Members of the New York Society, we extend to the industry our sincere best wishes for 1935.

NATHAN K. CONCANNON,
Executive Secretary New York Society
Exterminators and Fumigators, Inc.

Twenty-first Annual Meeting of National Association of Insecticide and Disinfectant Manufacturers

The twenty-first annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, held in the Hotel McAlpin, New York, December 10 and 11, attracted an attendance of some two hundred producers of these products. The four business sessions were well attended and a very active interest was shown in discussion of a number of scientific questions, as well as code and legislative matters. It was reported by NRA Deputy Administrator Ovid J. Roberts that approval of the code budget could be expected shortly, thereby making it possible for the industry's code authority to start functioning. Another development of particular interest at the meeting was the recommendation that the association establish a legislative committee to study laws, proposed laws and legislative tendencies as they affect manufacturers and distributors of insecticides and disinfectants.

Charles P. McCormick, President of McCormick & Co., Baltimore, was elected the new President of the Association, succeeding Peter Dougan, Merck & Co., Rahway, N. J.; W. H. Eddy, Rochester Germicide Co., Rochester, was named First Vice-President; William Griesemer, Black Flag Co., Baltimore, Second Vice-President; John H. Wright, Zonite Products Corp., New York, was re-elected Secretary; John Powell, John Powell & Co., New York, was re-elected Treasurer.

Members of the Board of Governors include: Samuel H. Bell, S. H. Bell Co., Pittsburgh; J. L. Brenn, Huntington Laboratories, Huntington, Ind.; William H. Gesell, Lehn & Fink, Inc., Bloomfield, N. J.; H. W. Hamilton, White Tar Co., Kearney, N. J.; Dr. Charles H. Peet, Rohm & Haas, Inc., Philadelphia; S. S. Selig, Selig Co., Atlanta; Dr. Robert C. White, Robert C. White Co., Philadelphia; William J. Zick, Stanco, Inc., New York, (all re-elected); and Wallace Thomas, Gulf Refining Co., Pittsburgh, and Dr. George F. Reddish, Lambert Pharmacal Co., St. Louis.

On the scientific side the principal discussion centered around the significance of the phenol coefficient in evaluating disinfectants. Dr. William Dreyfus, West Disinfecting Co., Long Island City, Dr. George F. Reddish, Lambert Pharmacal Co., St. Louis, and Dr. Emil Klarmann, Lehn & Fink Co., Bloomfield, N. J., participated in a discussion of this subject which extended over both days of the meeting. With no conclusion reached on the meeting floor, the matter was turned over to the scientific committee to be reported on at the June meeting.

Among the guest speakers at the meeting was Frank A. Blair, president of the Proprietary Association, who spoke on the code and legislative matters. He urged the industry to obey the provisions of its code and cautioned against counting too heavily on the government to enforce compliance. On the legislative side, he reminded his listeners, that besides the Federal Government with its proposed revision of the Federal Food and Drug Act, manufacturers may also have to face restrictive legislation from forty-four state legislatures which will be in session during 1935.

"Compensation of Sanitary Supply Salesmen" was the topic of a report by I. P. MacNair, MacNair-Dorland Co., New York, which was discussed at length on the floor by J. L. Brenn, Huntington Laboratories, Huntington, Ind., and Simon Selig, Selig Co., Atlanta. It was brought out in the report that commissions on sanitary supply sales range all the way from twenty to thirty-five per cent, but in spite of this rather high rate of pay, the salaries of salesmen average only about $40 per week. Among the other papers presented was one by Dr. J. H. Horsfall, American Cyanamid & Chemical Corp., New York, entitled, "Practical Moth Control"; a contribution by Dr. R. C. Roark, Insecticide Division, U. S. Department of Agriculture, "Recent Advances in Our Knowledge of Derris," and a paper by Dr. F. L. Campbell, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, on "A Rapid Laboratory Method for Testing Liquid Household Insecticides."

The concluding feature of the convention was the annual banquet held at the Downtown Athletic Club under the able chairmanship of Mr. Grant Dorland, of "Soap" magazine. Dinner was followed by a program of Metropolitan A. A. U. amateur boxing bouts.

Items of Interest

The Prophet Addresses the Asses

Then the Prophet addressed the asses. "Let us test your wisdom," said he. Answer me this question: "What would an ass require for a three-day journey?"

And they made reply: "For a three-day journey, O Prophet, an ass should require six bundles of hay and three bags of dates."

"Very good," quoth the Prophet, "that soundeth like a fair and proper price." Whereupon El-Sta-Shun-Air broke into loud chuckles and said: "Did I not tell you they are passing wise?"

The Prophet answered, "Wait," and again addressed the asses. "I have for you," he said, "a three-day journey, but I will not give you six bundles of hay and three bags of dates for making it. Let him who will go for less, stand forth."

And behold, they all stood forth and began to talk at once! One would go for six bundles of hay and one bag of dates, and finally one especially long-eared ass agreed to go for one bundle of hay.

Then spoke the Prophet: "Fool," quoth he, "you cannot even live for three days on one bundle of hay, much less profit from the journey."

"True," replied the long-eared one, **"but I wanted the business."**

And from that far-off day to this, asses have been known as fools and price-cutters have been known as asses.—The Apartment Journal, Los Angeles.

Criticism

It is so easy to find fault—with the other fellow, and yet if we realized what that fault-finding really meant, most of us would hesitate to express such criticisms aloud. For, say those who have studied the matter, we criticise most severely in the other fellow those weaknesses which are most strongly present in ourselves.

Perhaps that is the function of fault-finding—to act as a mirror in which we, if we will but open our mental eyes, may see our greatest weaknesses as a step toward their correction. To find fault and to continually criticise isn't a kindly act, but it harms the individual indulging in it most of all, since it advertises his faults to the world.

If you haven't any patience with mistakes made by those around you, just consider and the chances are you'll find that you yourself make quite a number of them during the day; your impatience with others is intended to show them that you are above making errors, although it tells those "in the know" that you make more than the average.

If we would but improve ourselves, we could do so materially by turning every criticism which we start to direct toward others to ourselves, and thus carry out what a wise man called the first duty of man; to know himself.

Fewer Pests for Kansas Farmers

Manhattan.—The drouth and heat blasted the Kansas farmer's corn, but it also killed his three greatest insect pests—grasshoppers, chinch bugs and the Hessian fly. Other insect pests died, too, but the "big three apparently suffered greatest loss to their ranks.

Prof. Roger G. Smith, department of entomology, Kansas State college, explained soil temperatures were so high that the bugs could not live. A maximum soil temperature of 151 degrees was recorded, whereas most of the insects could not live on bare ground when the temperature was 120 degrees, Smith said.

Chinch bugs, taken from the under side of cornstalk leaves, became inactive within ten seconds when placed on bare ground where the temperature was above 140 degrees. Most of the smaller insects died within a minute when so exposed, but the larger and hardier specimens lived as long as eighteen minutes.

Grasshoppers and chinch bugs normally thrive on hot weather, but it was too hot even for them, Smith said. Millions of chinch bug eggs were killed by the heat, he believes.

Moth Ball Gas Fatal to Grubs

WASHINGTON — Gas from ordinary moth balls is deadly to grubs of the Japanese beetle in the soil.

Additional Items of Interest are on page 22.

HOPKINS' • BIOLOGICALLY TESTED • INSECTICIDES

CROW BRAND PYRETHRUM CONCENTRATES

Our highly concentrated Pyrethrum Extracts are manufactured by a COLD PERCOLATION process, which insures UNIFORMITY and does not impair the toxic value of the Pyrethrins. Keeps to a minimum the extraction of vegetable dye and inert matter, an important advantage from the standpoint of staining. Moreover, these Concentrates do not precipitate while standing.

CROW BRAND INSECT POWDER

Made from high-testing grades of Dalmatian or Japanese Pyrethrum Flowers. Milling operations are conducted in our own plant. Our Powders are suitable for repackaging—or for use as ingredients in your own Powdered Insecticide—or for the percolation method of extraction.

ODORLESS CONCENTRATE

All-purpose non-poisonous Concentrate for use in electric vaporizing machines, odorless fly sprays, greenhouse clean-up sprays and special insecticides for Dairy and Food Plant use.

"THEY SELL BECAUSE THEY KILL"

REDRATSQUIL
Sold in Powder form and also in Liquid Extract form. Highly effective against rodents, but harmless to human beings and domestic animals.

PYRETHRUM SOAP
A Concentrated Agricultural Insecticide. Sold in semi-solid form, to be diluted with water at time of spraying. Sold in bulk for repackaging under your own brand.

ROACH AND ANT POWDER
For deadly, sure-kill results. This product contains a combination of powerful insecticides. Sold in bulk only.

HOPKINS' MOTHPROOFING COMPOUND
Kills not only the moths, but the eggs and larvae as well. Penetrates instantly, leaving no stains. Mothproofs fabrics indefinitely. Sold in bulk.

DERRIS POWDER AND EXTRACT
Sold in bulk—in either form—with a guaranteed Rotenone content.

DERRITOX POWDER
A product for use against fleas, lice and vermin. Contains Derris, Pyrethrum and other active ingredients. Non-poisonous.

DERRITOX SHAMPOO
A Liquid Shampoo, ready for use on animals. Highly effective as a vermin killer; containing excellent cleansing properties.

"Quality is remembered long after price is forgotten"

J. L. HOPKINS & COMPANY • 220 Broadway • NEW YORK

Picked Up From Here and There

Arthur Goulet and his son, Lawrence, of Detroit, Mich., enjoyed a little over a week of vacation in New York City. Nathan K. Concannon and "Bill" Buettner tried to guide the boys about the city. Incidentally, Mr. Goulet enjoyed the opportunity to attend the regular quarterly meeting of the New York Society, December 10th, and made the last night with the boys run into the wee hours of the morning. The last heard of some of the men were that at 5:00 a. m. George Saunders, Arthur Goulet, John Greene, and "Ginger" Durland were being taxied to their various homes by "Bill" Buettner in the National Ford.

Best of luck in your new home, Mr. G. H. Burnett, of Atlanta, Ga. Mr. Burnett is manager of the Getz Exterminating branch at Atlanta and the new address of the enlarged office and salesroom is 53 Forsyth St., N.W.

Tom Sweeting of the Atlas Storage Warehouse, Exterminating Department, of 4015 Walnut St., Philadelphia, Pa., was another visitor to New York for a week. This also reminds us to congratulate Dr. Ernest D. Wilson on his appointment as Technical Advisor and stock holder in this company. Best of luck.

Walter McCloud of the McCloud Exterminating Co. of Chicago presented a few of the boys with a handsome appointment pad. Thanks, Walter. The National Association office will always be pleased to receive donations of various advertising products. The Guarantee Exterminating Co. has distributed a handsome pencil to their customers. Others have presented calendars. Send them on; they are welcome.

Milford "Mallium" Oachs of the Ozane Co. of New York City has been busy with jury duty. What an opportunity for the boys to solicit some of the leads that Milford has been forced to neglect? And with it all, business is reported as good.

Thinking of the last line of the previous paragraph also reminds us that E. H. Arnott of Indianapolis reports the same. Mr. Arnott is to be commended on his work as chairman of the Public Relations and Research Committee. This committee will continue to have interesting information for members of the National Association. If you have any ideas, feel at liberty to send them to Mr. Arnott at 762 Massachusetts Ave., Indianapolis.

"Russ" Lee of Detroit, the National Association Director, reports that the local association will get the "ball rolling" in earnest for the convention to be held October 14, 15, 16 at Hotel Statler. This active group are working with C. Norman Dold of 208 North Wabash Ave., Chicago, who is general chairman of the convention.

The Sherwood Petroleum Company, Inc., recently made important changes in its personnel by transferring V. L. Roberson, Chicago branch manager to the main office at Brooklyn, N. Y., in charge of sales. Mr. Robert T. Kennedy of Cincinnati, Ohio, has been placed in charge of the Chicago Division, which embraces several of the middle states.

Roberts Products Co., insecticides, formerly located in Pittsburgh, has moved to Philadelphia where the concern is located at 132 North Fourth street.

S. B. Penick & Co., New York, pyrethrum and derris products, have opened a branch office in Chicago at 1228 West Kinzie street. This will put the company in position to give a more efficient service to its customers in the mid-western territory. Complete stocks will be carried in Chicago and overnight deliveries in the city will be possible. Harold Meyer, who has been in the New York office for a number of years, has been made manager of the new branch. Carl M. Black is general representative for S. B. Penick & Co., in Chicago and vicinity.

Admiration Century Exterminating Co., Brooklyn, N. Y., has moved to 1465 Fulton street, Brooklyn.

A.A.A. Master Exterminating Engineers, Chicago, has recently moved from 507 to 192 North Clark street.

Arthur Henriksen, formerly vice-president and general manager of Norda Essential Oil and Chemical Co., New York, has started operations under his own name, with of-

fices at 30 Irving Place, New York. Essential oils, aromatics and perfume specialties will be handled. Mr. Henriksen has had a long and varied experience in this field. Before entering the supply end of the perfuming business he was chief perfumer for the Palmolive Company.

A survey of individual likes and dislikes for various odors, conducted by Givaudan-Delawanna, Inc., New York, shows that the odor of kerosene is one of the odors most generally disliked, being surpassed on the negative side only by the odor of glue. Of the other 37 items listed, the following standings are also of interest: 4th place, dry cleaning fluid; 14th, moth balls; 18th, shoe polish; 20th, metal polish; 27th, furniture polish; 29th, auto polish, and 32nd, floor wax. The table is arranged in the order of decreasing dislikes of odors. We believe many of our readers would be interested in a copy of this table. Send your name and address to the Log, and a copy will be forwarded you.

Victor L. Roberson, who has been plant manager for Sherwood Petroleum Company in Chicago, has been elected a vice-president of the company and will in the future make his headquarters at the main office in Bush Terminal, Brooklyn, N. Y. R. T. Kennedy will succeed Mr. Roberson in charge of Chicago plant operations.

The use of kerosene containing a half pound per gallon of pyrethrum powder is recommended in places infested with termites. Timbers impregnated under pressure with coal-tar creosote are termite-proof.—E. I. McDaniel, Michigan Agricultural Experiment Station Circular, Bulletin 150, 3-14 (1934).

New Patents

No. 1,976,780, Insecticidal Composition, patented October 16, 1934, by Dudley H. Grant, Brekeley Heights, N. J., assignor to Stanco, Inc. As an insecticidal composition an oil wax gel comprising refined mineral oil and a wax having a melting point above 90° F., the composition being capable of breaking down readily under friction to liberate the insecticidal oil.

No. 1,977,412, Insecticide, patented October 16, 1934, by Ray E. Spokes, Ann Arbor, Mich., assignor to Edgar A. Murray Company, Detroit, Mich. An insecticide adapted for combating moths or the like and including a highly volatile, non-greasy petroleum base having a chlorine-hydroxy substituted diphenyl exhibiting a crystalline characteristic dissolved therein, and having crude scale paraffin wax and stearic acid anilide to provide an effective bond to the fabric and to prevent crystallization of the active ingredient and dusting off from a fabric to which the insecticide is applied.

Mr. and Mrs. B. W. Eldredge of the Waltham Chemical Co. at Waltham, Mass., are starting on a pleasant vacation to Bermuda just as we are going to press. Bon voyage and may this January issue of the Log greet you on your return. Mr. Eldredge spent a busy morning in New York City just before sailing on January 12th.

Approval of a $25,000 budget for the agricultural insecticide and fungicide industry has been announced by NRA, with contributions to be made on the basis of one-tenth of one per cent on the actual net sales during the budgetary period. Even those whose main line of business is in some other field must contribute, according to a recent order, unless sales of products under this code are less than $2,500 annually and less than ten per cent of such company's total net sales.

Henry Turrie of the Wil-Kill Exterminators of Milwaukee claims that the severe cold has made the bugs dormant, but this gives greater opportunity to reflect on the pleasant time enjoyed at the St. Louis convention. Many will recall that Mr. Turrie came from his sick bed to attend. He and "Bob" Laing of Cleveland took the prize for attending under adverse conditions, but both were well fortified as to being properly taken care of by having their wives along to "nurse" them over any rough spots.

Call this free advertising or anything you want, but we commend to fumigators the use of the CURRY LOCK. More particulars will be gladly given by writing to H. A. Curry Exterminators, Inc., at 8116 Wade Park Avenue, Cleveland, Ohio. Be good enough to give the Log credit when writing.

It almost appears that the South is putting on a concerted drive to have the annual convention head in their direction in a year or two after Detroit, if one is to judge by the activities of many in that section. The Temple Lumber Co. of Houston, which specializes in termite work, has enrolled their two termite divisions at Corpus Christi and Dallas as associate members; Joseph Mandelbaum of New Orleans is after new members; Otto Orkin has sensed the good use toward which a box of select "bouquet" cigars is being passed around at the National Association office; F. A. York of Atlanta follows through with enthusiastic cooperation; H. O. Abel is ever on the alert, and F. A. Burnett is spreading word around about the good work of the National Association as he travels from city to city for the Getz Exterminators. What a delegation this will be when they arrive at Detroit next October.

Mr. and Mrs. A. E. Ritt of Philadelphia are to be congratulated. We understand that the new arrival, "Donald," has already learned how to "squawk" and keep father Ritt walking the floor from 10 p. m. to 4 a. m. We wonder if Mr. Vogel (Mr. Ritt's partner) purposely left town for Washington so that he would not be pressed into service.

Richard Dodge of Portland, Maine, reports that he is emphasizing among his clients, many of whom have plants in the South to seek exterminators and fumigators who display the National Association seal and slogan.

Will someone tell us what should make St. Louis exterminators and fumigators sick? Our latest reports tell us that "Bill" Martin had an attack of lagrippe that kept him down for twelve days and President Tom Raley of the National Association was confined to his bed for a week. Hope all is O.K. by now.

Real Exterminating Products Co. have moved from 3906 Easton Avenue to 1900 N. Ninth street, St. Louis, Mo.

National Association Notices

Communication No. 5: This has gone forward to the active membership and to those firms which were listed as members as of 1934 and with it statements for 1935 dues. In the future only active members in good standing wil receive the strictly Association communications.

Application Forms For Membership may be had by writing to the secretary. The National Association is interested only in "QUALITY" membership so that the public and clients for whom business is done will look for the firm that uses the National seal and National slogan "Don't Tolerate—Exterminate."

Grateful Acknowledgment is made to the many firms throughout the country that have sent Christmas. New Year and Holiday greeting cards. The exchange of cards amongst the members has been very noticeable this year and bespeaks a growing spirit of co-operation.

Convention Dates have been definitely set for Monday, Tuesday, Wednesday. October 14th, 15th and 16th with headquarters at Hotel Statler, Detroit, Michigan. Mark your calendars now.

Liability Insurance Coverage: The National office will gladly co-operate by giving information to all members as to coverage for both exterminatng and fumigating liability insurance.

Contract or Agreement Forms: Many firms have expressed a desire to improve their present forms. The National office will co-operate by giving suggestions. It always assists to send your present form together with the criticism you now have as to the form being used.

Ten Commandments

1. Don't lie. It wastes my time and yours. I'm sure to catch you in the end and that's the wrong end.
2. Watch your work, not the clock. A long day's work makes a long day short and a short day's work makes my face long.
3. Give me more than I expect and I will give you more than you expect. Increase my profit and I will increase your pay.
4. You owe so much to yourself that you can't afford to owe anybody else. Keep out of debt or keep out of my store.
5. Dishonesty is never an accident. Good men, like good women, can see temptation when they meet it.
6. Mind your own business and in time you'll have a business of your own to mind.
7. Don't do anything to hurt self-respect. The employee who's willing to steal for me is capable of stealing from me.
8. It's none of my business what you do at night, but if dissipation effects what you do next day and you do half as much, you'll last half as long.
9. Don't tell me what I like to hear, but what I ought to hear. I don't need a valet to my vanity, but I need one for my money.
10. Don't kick if I kick. If you're worth while correcting you're worth while keeping. I don't waste my time picking specks out of rotten apples.

California Spotlights

By CHARLES HOMER SPOTTS

Architects, Builders and Owners of Southern California may be highly complimented on the beauty of design, closely following the old MASTERS in line, form, proportion, comfort and creative grandeur but the "weak-link" is their utter failure to provide any degree of permanency or real stability of protection to their structure in *proper* foundations, height of woodwork from the ground, correct and adequate "cross ventilation," freedom of foliage from blocking air currents and preservatives in and upon wooden surfaces to resist attacks of Termites, Fungi and Dry Rot.

The perils of Termite destruction have been well played-up in Technical, Trade Papers, Magazines, Newspapers and "Direct Mail" education but the Architects generally are indifferent to proper designs and methods to guard their clients interests against the Termite and Wood Boring insects that are so very prevalent in Southern California. Again, but little provision is provided against a *constant* menace—FUNGUS (Poria incrassata) a ground and wood infesting organism. These germinating bodies are filled with spores. Scattered with the wind, water, Termites and in many ways by man himself. Commonly called the "Cancer of the Wood." Moisture in the atmosphere and warmth of climate develops and spreads it. Your Staff Correspondent has studied and inspected "wood destruction" in thousands of structures in Southern California, the entire Pacific Coast and adjoining states and throughout the Nation and produced personally the first Motion Pictures ever made of Termite activities in wood. It is our judgment, that to overcome Termites. Rot in Wood caused by fungi or parasitical plants that grow in timber or in the ground and feed on wood substance, including Termite and grubs of wood boring beetle, that chemically impregnated wood must be used that can be painted over, if desired—that is uninflammable, odorless, colorless, clean and *will not leach out*. The Department of Building and Safety of Los Angeles are battling with the problem of adequate wood preservation and while present Building Code provisions largely recognize "Creosote," yet provisions are included for continued investigations and approval of "proven tested" products. The writer hopes in this connection to have a statement shortly for the "Exterminators Log," on *Wood Preservation by Impregnation* by Mr. Ralph Morris, Consulting Engineering Laboratories of Bank of Transamerica Building, Los Angeles, as Mr. Morris is an Authority and his Staff is inspecting the larger percentage of wood that is being used in building construction in the Southland.

Sambo: "Hambone, does you believe in clubs fo' women?"

Hambone: "Only as a las' resort, an' den only when de woman is so big you caint handle her no othah way."

According to Eli Lloyd Hoffman, two movie-struck flies were trying to get a part in Mickey Mouse's latest cartoon. Both of the pests were conversing:

First Fly: "Why are you so gleeful?"

Second Fly: "Whee—and buzz, buzz. I just passed a screen test."

Why do they have so many unnecessary holes in Swiss Cheese when it's Limburger that really needs the ventilation.

The Termites of California and the Horned Toads of Texas have a rival in the Nevada Termites. Ely, Nevada, tells of the tearing out of the foundations of the White Pine County Courthouse. Embedded in the thick concrete was eight-inch timbers in which were living Termites—no cracks were found or signs of tunnels through which the ants could have reached the wood.

The Medical Service of the Indian State of Hyderabad take a census of mice, with a tabulation of the number of flies. They give over specific weeks to an "intensive" rat drive, during which tens of thousands of rodents are killed to reduce the extent of diseases carried by them.

In Moscow, Russia, the Fur Trust supplies gratis to factories, offices and house committees, traps for rat hunting. The pelts are used to make coats for the proletariat. Workers and office employees are induced to chase rodents through a special price for each skin and a coupon entitles the holder to spend all the money earned in this way for clothing, shoes, tobacco and other rationed articles.

The eroding effects of the acids in the digestive tract of rats is well illustrated in the experiments of the University of Chicago, who recently offered a striking demonstration of one rat that was fed a steel ball bearing which remained in the digestive tract for fifteen days—at the end of that period it weighed twenty-four per cent less than when swallowed. Another rat was fed small pieces of iron which were found to have lost more than twelve per cent of their weight during ten and one-half days in the digestive tract.

Lady Shopper: "I don't like the looks of that Haddock."

Fish Dealer: "Lady. if it's looks you're after, why don't you buy a Gold Fish."

Assistant Editor "Here's a subscriber who wants to know why they whitewash the inside of chicken houses."

Editor: "Tell him it's to keep the chickens from picking the grain out of the wood."

THINGS TO REMEMBER FOR A HAPPIER LIFE ON EARTH—"The one who has conquered fear has also conquered failure." "Man was given a tongue that he might say something pleasant to his fellowman." "Kind words cost no more than unkind ones." "A dead horse cannot eat grass, nor a dead lover kiss red lips." "Attend properly to your own business and you won't waste time on other people's."

GOOD TRAINING — He: "Would you scream if I kissed you, little girl?"

She: "Little girls should be seen and not heard."

LIKE CALIFORNIA—The Dead Sea, rich in chemicals, is estimated to have $1,200,000,000,000 worth of potash alone. The potash is recovered by pumping the water into ponds and letting the sun do the rest. Gardens of workers on the banks grow beans two feet long and radishes as big as a policeman's shillalah—and oranges that weigh a pound.—Los Angeles Times.

"A TELEPHONE BUG"—not the pest that calls up at the "wrong time"—when the favorite program is on the radio or when one is in an important business conference. The tiny bug that we tell about is known to telephone folks as the "lead-eater." The scientists call it a Scobicia Declivis. Between Chino and Ontario, Calif., the Associated Telephone Company's line was short-circuited to 300 subscribers by moisture seeping into a tiny hole bored through twenty-four layers of lead insulating foil by this bug of about the size of a grain of wheat. The construction and maintenance men of a telephone company have to be Sherlock Holmes and Dr. Watson sleuths to detect after weary hours the little holes caused by the appetite of the "lead-eaters."

Professor William Morton Wheeler of Harvard College writes interestingly and convincingly of the ant in the Scientific Monthly. The Los Angeles Times takes editorial note of this splendid contribution to better knowledge of the tiny but active ant. The Professor says there are 10,000 different specie of the ant and they have been trying out social customs for hundreds of millions of years, therefore their advancement over human beings in their loyalty, co-operation and devotion to the highest ideals in the art of living together —and THE FEMALE IS BOSS.

In Los Angeles the United Castings Co. for several years has been marketing a very unique screen for windows and also placement in restaurants, kitchens, dairies, barns, etc., of an Electric Fly-Killer, known as "Electro-Kil." It gets them quick. Now the University of California College of Agriculture at Davis, Calif., has perfected a trap for placing around Clear Lake beaches that will **Electrocute** the millions of gnats that make life miserable for the bathers, boating and picnic parties. Knocks them dead—the light traps prove a "gnat crematory."

DANIEL FROMAN, the 83-year-old Dean of the American Theatre, has devoted 50 years to the study of Shakespeare's plays. Mr. Froman tells Edwin C. Hill, who radios and writes the "Human Side of the News," that Shakespeare had the greatest mind, the best furnished-mind of any man who ever lived—greater than Aristotle's or Plato's. His knowledge of the technical side of science, in the fields of botany and medicine and horticulture and other highly specialized activities was amazing.

AN "IRRITANT" BODY INSECT—Walter Winchell in his "Daily Tattle" for the newspapers is a keen descriptionist of rare happenings and personalities. He tells a good one on Actor Kaufman. While driving with a pal he was seized with a delirum of frantically slapping his body to crush some crawling insect, which he seemed unable to thud off his body. Kaufman opened his coat and shirt and grasped the crawling thing to throw it through the automobile window—the "beastly" thing was merely a **laundry label** on his underwear.

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

CUTS of rats, roaches, moths, bedbugs, ants, flies, etc. EXTERMINATORS LOG, Cut Department.

Doctor to Create Pupils In Eyes Ants Destroyed

Baby Blinded in Gadsden Tragedy May Be Given Partial Sight in Operation

Science with the aid of nature will attempt to restore the sight of little Harold Watson Patrick, seven-months-old son of Mr. and Mrs. G. W. Patrick, of Gadsden, Tenn., when an operation is performed at the Memphis Eye, Ear, Nose and Throat Hospital.

The baby was blinded in the early summer by the stings of red ants near his home.

A Memphis eye specialist, with an international reputation, will do the operation, which consists of creating artificial pupils. If the surgeon is successful the child will be given some vision. At present he can only tell light from dark.

An examination of the child's eyes was made on June 27 and at that time it was decided to give nature a chance to heal the eyes and to allow the child to gain resistance.

The child's eyeballs (the cornea) were damaged by the ants in such a way as to leave dense scars. The pupiliary area was entirely covered by these scars.

The superior peripheral part of the cornea is clear enough so that the iris can be seen through it and a fundus reflex can be seen, the surgeon explained.

This indicates to him the possibility that the interior of the eyeball is all right. The idea is that if an artificial pupil can be made through the iris behind this clear part of the cornea some vision may be obtained. In this case, the iris or colored portion of the eye, acts as a curtain to the clear part of the cornea. By taking out some of the iris an artificial pupil may be established and the baby will have a certain amount of vision, but as the pupil will not be in the regular place, full vision cannot be hoped for.

30 Planes Used in Weevil Battle

SAN ANTONIO—More than 30 airplanes were used this year in dusting cotton fields in Louisiana, Mississippi and Texas to control the boll weevil.

Items of Interest

German Finds Parasitic Ants

Interlopers Enslave Colony and Live From Work of Deceived Insects

By Science Service

MUNICH—Parasitic ants of a new species, recently discovered in southern Germany by Dr. Karl Gosswald of the Institute for Applied Zoology, Munich, set a new record for insect racketeering. If Solomon could have seen these insects, he might have hesitated about making a blanket commendation of ants in general as models of industry and thrift.

This ant's career of wickedness begins when a fertile queen intrudes herself into the nest of another species of ant—the normal handworking kind that inspired Solomon's praise. Ordinarily the workers in the nest would make short work of any stranger, but she somehow manages to flatter herself into their good graces.

Kill Rightful Queen

Proceeding thus unmolested to the chamber of the rightful queen, the invader springs upon her back and fastens her strong jaws into the body of the much larger insect. The home queen does nothing to defend herself, and the workers still pay no attention.

After the rightful queen is dead, the invading queen is accepted by the duped workers as their own. She proceeds to lay eggs of her own parasitic species, which are cared for by the workers.

These eggs produce "neuters" or undeveloped females, which in a normal ant species constitute the worker caste. But in this parasitic species they are as useless as their mother, living lives of complete idleness, accepting the food the active workers bring them and giving no thanks for it—as typical a lot of alien aristocrats as ever afflicted a community, whether ant or human.

Perpetuate Slavery

It might be expected that when the last of the workers had died off, the helpless parasites would perish. But here the nature of the "host" ant workers intervene to play a mean trick on them and perpetuate their slavery.

Normally, when an ant colony loses its queen, some of the usually "sexless" workers lay unfertilized eggs, just as worker bees do under similar circumstances. These eggs develop only male or drone insects, useless as workers. But with these poor afflicted ants, the eggs laid by the workers produce new workers, so that the "aristocratic" idle parasites always have a full population of exploitable "proletariat" workers to take care of them.

The only way for a busy man to get through his work is to take up one thing at a time and stick to it until he puts it through.—The Commonwealther.

Amyl Nitrite and Sodium Hyposulfite in Potassium Cyanide Is Poisoning

A. Buzzo and R. E. Carratala. Abstr. from Semana Med., Dec. 7, 1933, p. 1772, in Brit. Med. Jour., April 21, 1934, p. 64.

Experimenting on rabbits, the authors record success in eighty per cent of all cases treated with inhalations of amyl nitrite associated with intravenous injections of sodium hyposulfite, even after the animals had taken very many times more than a lethal dose of potassium cyanide. They declare that the hyposulfite is almost non-toxic to the rabbit and is manifestly superior to sodium nitrite, which is poisonous, even though when given in fractional doses it has been sometimes successfully employed in cyanide poisoning. Rabbits subjected to inhalation of amyl nitrite did not succumb until it had been kept up for fifteen minutes continuously.

The experiments performed were as follows. With a stomach tube the cyanide was introduced into the stomach of the rabbit, after which four or five grams of hyposulfite were injected into a vein. Simultaneously inhalations of Martindale's amyl nitrite were given for fifteen to forty seconds, every three or five minutes at the commencement, but with lengthened intervals if the pulse and respirations approximated the normal rates, so that finally the drug was being administered only every two or, in some cases, every five hours. Success was achieved in all cases in which the poison had been administered in fourteen times the lethal dose, and in eight cases out of ten in which the animals had received doses sixteen times greater than this.—Journal of Industrial Hygiene, Vol. XVI, No. 4, July, 1934, Pg. 79.

Rat Hunting Latest Sport in Bucharest

BUCHAREST (US)—Bucharest is enlisting pied pipers to lure away the millions of rats pestering the city.

The tearing down of numerous old buildings in a program of improvement has sent rats wandering about, looking for new quarters. Late at night, dense packs of rodents cross the Calea Victoriei, Bucharest's Broadway, and many a woman in evening dress is frightened out of her wits by the gruesome nocturnal processions of homeless rats.

To assist in ending the plague, the Rumanian association of dog breeders has organized rat catching contests and a special arena has been built for this new sport. The equivalent of 20 cents in paid for each live rat brought to the arena as a sacrifice to the dogs.

Thus, Rumania's canine species are trained in the noble sport of rat-catching while hundreds of jobless have found employment.

We wish you
all a Happy
Prosperous and
Successful 1935.

Non - Poisonous

Sur-Rid-Rat-Killer

This New Marvelous Super-Raticide Will Do All It Claims

At last a scientifically prepared rat food ready for use has been discovered. SUR-RID-RAT-KILLER contains meats, vegetables and cereals, hermetically sealed in one pound tin cans. There is no artificial lure added. It costs only twenty-one cents per pound for a mixed, ready-to-use rat killer.

Price: $2.50 per dozen, packed three dozen to a carton, f. o. b. St. Louis.

Send $1.00 and we will send you three one pound samples, prepaid.

Also packed under private label.

REAL EXTERMINATING PRODUCTS CO.

1900-04 NORTH NINTH STREET

ST. LOUIS, MISSOURI